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A Longitudinal Study of Academic Achievement in Terms of Age of Entry Into First-Grade.

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A LONGITUDINAL STUDY OF ACADEMIC ACHIEVEMENT IN TERMS OF AGE OF ENTRY INTO FIRST GRADE

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ABSTRACT

The problem under investigation was stated as follows: Is there a significant difference in the academic achievement of students when compared on the basis of age of entry into first grade?

The four-year longitudinal study was comprised of 495 students who entered the first grade in the Livingston Parish, Louisiana Schools during the 1967-68 school year and who had been administered the SRA Achievement Series during each year under study. The scores in the selected areas of achievement were categorized according to: (1) the quarter of the calendar year in which the student was born; and (2) sex. A four by two factorial analysis of variance was performed to determine: (1) the over-quarter differences in achievement between the sexes; (2) the over-sex differences in schievement between the quarters; and (3) the interaction between quarter of birth and sex.

The following null hypothesis was tested for each dependent variable: There are no statistically significant differences in the achievement scores among students born in different quarters of the same calendar year as measured by the SRA Achievement Series. F-values were computed and tested for significance at the .05 and .01 levels of confidence.

In the analysis by year of each dependent variable, where significant differences existed, linear orthogonal comparisons were employed to determine if the regression trends were significant. F-values were tested for significance at the .05 and .01 levels of confidence.

Findings Using Quarter of Birth as the Source of Variation

1. The quarter effect was significant in all areas of achievement in grades one and two except for the variables arithmetic computation, reading comprehension and reading vocabulary.

2. When no significant difference was found, an examination of the achievement means revealed a decrease in mean achievement from quarter one to quarter four.

3. When differences proved significant, a linear orthogonal comparison revealed that the decrease in mean achievement approximated a straight line regression.

4. In grades three and four, the quarter effect ceased to be significant for all achievement variables.

Findings as Related to Sex

1. Sex was not a significant factor in the acquisition of arithmetic skills in grades one, two and three.

2. In grade four, the mean female arithemtic score was significant at the .01 level of confidence.

3. The sex effect in reading achievement was significant at all grade levels under study. The mean female reading score was significantly higher than that of male students with the exception of reading vocabulary at grade one.

Findings as Related to the Interaction of Quarter of Birth and Sex

The interaction effect was not significant in any area under consideration. The over-quarter achievement between the sexes was consistent from quarter to quarter.

Conclusions

1. Chronological age influenced achievement in grades one through four. Even though the quarter effect was not statistically significant in grades three and four, an examination of the over-quarter mean achievement scores for all variables indicated that the mean achievement scores for the first two quarters of the year were higher than those found in the third and fourth quarters.

2. Sex, as a factor in achievement, showed to be increasing in influence as the years of the study progressed. The mean female achievement score, significant in three areas in grade one, was significant at the .01 level of confidence in all areas of achievement in grade four.

Chapter 1

INTRODUCTION

The minimum age at which a student can enter the first grade varies from state to state. Regardless of this age there is a difference in the maturity level of students. In the state of Louisiana, a student born on the first day of a year and a student born on the last day of the same year can, by law, enter the first grade at the same time. The problem of differences in maturity is compounded by the possibility that a student born in the last quarter of the previous calendar year can also enter at the same time. This represents an age differential of fifteen months.

Teachers and administrators have long been cognizant of the problems introduced by the difference in maturity. Yet, while recognizing their existence, very little research of a conclusive nature has been done. The results of these studies often give conflicting evidence.

Adams and Fleniken (1972), in a study of the achievement of students born in the first and fourth quarters of the year, found that significant differences in certain areas of achievement did exist in grades three, four and six. The mean scores in all areas of achievement favored the older group. Due to the limitations of the study, no broad generalizations were justified. However, one basic question was raised: If the gap in achievement between age groups closes, when does is close?

Toquinto (1968), in a study of chronological age at the time of entry to first grade to subsequent academic achievement found the following:

1. Based on the results of the Lee-Clark Readiness Test, a greater percentage of underage students (seven to twelve months younger) were recommended for delay in formal reading instruction.

2. On achievement tests at grades three and five, the overage group, although not statistically significant, scored higher in every area.

Hurley (1964), in a study of the progress of early starters (five years, nine months in age) and late starters (six years, eight months in age) found the mean difference on readiness tests to be significant at the .01 level of confidence. Children, one month apart in chronological age and one year apart in school, did show significant differences in performance.

Denoyer (1970) found that the age of a student had little or no effect on academic achievement as measured by achievement tests and grades given by teachers.

This study provided additional evidence as to the influence of chronological age upon academic achievement and furnished supplemental data as to the length of time that maturation was a significant factor.

Statement of the Problem

Is there a significant difference in the academic achievement of students when compared on the basis of age of entry into the first grade?

Delimitations

The students in the sample met the following criteria:

1. Entered the first grade in the Livingston Parish Schools, Livingston Parish, Louisiana, in the 1967-68 school year.

2. Were administered the SRA Achievement Series at each grade level, one through four.

3. Were not retained at any grade level.

THEORETICAL FRAMEWORK

Definitions

Age. In this study age was defined as the quarter of the calendar year in which the student was born.

Academic Achievement. Academic achievement was here defined as raw scores on the SRA Achievement Series.

Arithmetic. The term arithmetic was defined as the composite score of the sub-tests in the arithmetic test of the SRA Achievement Series.

Reading. Reading was defined as the composite score of the sub-tests in the reading test of the SRA Achievement Series.

SRA Achievement Series. The SRA Achievement Series is a standardized test published by Science Research Associates (copyright 1964) consisting of three batteries, 1-2, 2-4, and Multilevel: Blue, Green and Red. Battery 1-2 is recommended for use in the last part of grade one through the middle of grade two. Battery 2-4 is recommended for use in the last part of grade two through the middle of grade four. In the Multilevel, the Blue battery is used in the last part of grade four through the middle of grade six, the Green battery in the last part of grade six through the middle of grade eight, and the Red battery in the last part of grade eight through grade nine.

Significance of the Study

There is a definite lack of research as to the relationship of chronological age to academic achievement. A longitudinal study of this type was needed to provide additional information and to serve as an additional basis for further study.

This study also provided data which is useful in determining if a re-assessment of the minimum age for entrance into grade one is needed.

Source and Treatment of Data

Students in each grade level of the Livingston Parish Schools, Livingston Parish, Louisiana, are administered the SRA Achievement Series each Spring semester. Achievement test scores from two tests, Arithmetic and Reading, were used from each battery. In grades one and two, the Arithmetic test consisted of three sub-tests, Reasoning, Concepts, and Computation; in grades three and four the Modern Math Understanding Test option was exercised. This option did not include sub-tests, so the only score utilized was the composite score, Arithmetic. Two sub-tests from the Reading test were used, Comprehension and Vocabulary. The composite score of each test, Arithmetic and Reading, was also utilized in the study.

The raw scores of each student were categorized according to: (1) the quarter of the calendar year in which the student was born; and, (2) sex.

A four by two factorial analysis of variance was then performed upon the data. The total variance was partitioned into three sources of variation; (1) quarter of birth; (2) sex of students; (3) quarter of birth by sex interaction. Each source of variation yielded an

F-value, the significance of which was tested at the .05 and .01 levels of confidence.

The analysis of variance procedure was employed to test for differences in achievement for:

1. Over-quarter differences between the sexes.
2. Over-sex differences between the quarters.
3. The interaction between quarter and sex. (Are differences in achievement between the sexes consistent from quarter to quarter?)

Where significant over-quarter differences in achievement were found, linear orthogonal comparisons were employed to determine if a significant linear trend existed. Values for Q^2 were computed and F-values were obtained by dividing Q^2 by the mean square error of the variable under consideration. Significance was tested at the .05 and .01 levels of confidence.

Tables and graphs were constructed to visually depict the data obtained in this study.

Chapter 2

REVIEW OF RELATED LITERATURE

The purpose of Chapter 2 is to review the literature pertaining to academic achievement as it relates to chronological age or the maturation of students.

The maturity of students has long been recognized as a factor in the achievement of students entering the first grade. First-grade teachers have long been aware that a student born in the first few months of a given year has an achievement advantage over a student born in the last few months of the same year.

King (1955;336) perhaps best summarized this school of thought when she concluded that:

> Having attained a few additional months of chronological age at the beginning of grade one is an important factor in a child's ability to meet imposed restrictions and tensions that the school necessarily presents. Younger entrants will have difficulty attaining up to grade level in academic skills and a large portion of them may fall far below grade level standards.

Studies concluded prior to and subsequent to King substantiate her conclusion.

One of the earliest studies to address itself to this question was conducted by Partington (1937). The purpose as stated was "to study the relationship, if any, between the chronological age of pupils and later scholastic success." The six-year longitudinal study was composed of students whose entrance ages ranged from 5.0 years to 7.5 years. The students were divided into groups whose age differential was six months. The following conclusions were reached:

1. Many of the children whose entrance age was 5.0 - 5.5 years are capable of and do achieve excellent results.

2. The youngest group contained the largest percentage of those students who are capable of achieving better results.

3. Low chronological age is a handicap, for with greater maturity these students might achieve better results with less strain.

Subsequent studies by Beattie (1970), Bigelow (1934), Carroll (1963), Fehrle (1964), Gott (1963), Harrell (1970), Keister (1941), Koch (1968), Melvey (1970), and Switzer (1973) tend to substantiate the findings of King and Partington. Although the research techniques differed in the breakdown of chronological age patterns, the same basic conclusion was reached: Chronological age was a significant factor in the achievement of students.

While the afore-mentioned studies made no attempt to control variables such as age and I.Q., additional studies have been conducted using the matched-pair technique. Baer (1958), Carter (1956), DeWitt (1961), and King (1955), in studies where the achievement of early entrants was compared with that of normal entrants when I.Q. and sex were held constant, concluded that the older group was significantly superior in achievement.

Howell (1962) added a third criterion, socioeconomic status. The results corroborate the influence on chronological age at the time of entrance into first grade to subsequent academic achievement.

However, there are studies the results of which diametrically oppose those previously cited. These results concluded that the achievement of the early entrant was equal to or superior to that of the late entrant.

Handy (1938) reported the findings of a study conducted in the Plymouth, Massachusetts Schools. The Plymouth school system utilized a combination of chronological age requirements and mental testing for those who did not meet minimum age requirements for admission to school. An examination of the records of these students when compared to normal-age youngsters revealed:

1. The percentage of failure was less.
2. The percentage of C's was less.
3. The percentage of A's and B's was greater.

In the elementary grades the underage students attained better marks than did normal-age children. Handy further concluded that the chronological age of neither the underage student nor the normal-age student determined academic success.

More recent studies, particularly concerned with the relationship of chronological age to the acquisition of reading skills, tend to substantiate these results. Hirst (1970) cited the following studies. Andres (1965) found that no significant correlations existed between chronological age and reading achievement at the end of the first grade. Hayes and Nemeth (1965) in a study of first-grade reading achievement found the correlation between reading and age to be under 0.14. Somwaru (1965) in a study of twenty four classes in the Toronto area through grade two concluded that age seemed to have very little, and sometimes, negative correlation with the ability to read. Dystra (1966) also concluded that chronological age was unrelated to reading ability. Barrett (1963) found negative correlations between chronological age and reading achievement.

Hirst, in a three-year longitudinal study of 300 kindergarten children, concluded that "age did not emerge as a significant predictor variable for the academic success of first or second graders. Research over the last five years appears to agree that age does not hold up as a significant predictor variable for academic success."

Meyer (1961:70) stated:

> A thoughtful survey of the literature presents no study which proves conclusively that an older chronological age for first-grade children is the solution to the problem, but some data and many opinions favor that viewpoint.

Worcester (1956:35) concluded, "studies have agreed almost 100% that the younger student has the advantage over others in nearly every aspect and is at a disadvantage in almost no respect."

Other studies have been conducted that, while concluding that maturity was a significant factor, differed as to the length of time that it significantly influenced academic achievement.

Indrambarya (1970) found age to be a significant factor in predicting readiness scores and achievement in grades one and two, but it ceased to be significant in grades three and four.

Miller and Norris (1967) found that differences in achievement due to entrance age tended to disappear at the end of grade two.

Baer (1958) stated that the initial differences in achievement of underage students tended to decrease as they progressed into higher grades.

Conversely, other researchers contend that the differences in the achievement levels of younger students when compared to older students remain constant or in some cases, increase.

Keister (1941) suggested that the influence of age continues to persist.

Carter (1956) concluded that the level of achievement tends to remain constant throughout the years of elementary school.

Harrell (1970) stated that entrance age into first grade affects scholastic achievement of either sex at the twelfth-grade level.

The question of whether the achievement rates of boys and girls differ is one which has not been conclusively answered. A survey of the literature reveals differing results.

Indrambarya (1970) found that sex was not a factor in the prediction of academic success. Whyte (1972) found no interaction of age with sex. Fehrle (1964) concluded that no significant differences in achievement between boys and girls existed.

Conversely, other studies have reached quite different results. DeWitt (1961) found that: (1) the effect of chronological age was more pronounced upon boys in younger and normal age groups than it was on girls of comparable intelligence; (2) girls consistently scored higher in achievement tests than did boys of comparable intelligence.

Howell (1962) found the total achievement of girls born in January through April was higher than that of boys born during the same months, the difference being significant at the .05 level of confidence. The comparison of younger females to younger males yielded no statistically significant differences, but in grades two, three, and five, the mean difference favored the younger girls.

Toquinto (1968) found that girls achieved higher scores on three of five areas tested in grade three and five of eleven areas in grade five.

Switzer (1973) found that girls exceeded boys in all areas of achievement.

Baer (1958) found that girls marked higher than did boys in their respective groups.

Summary

Evidence supportive of the effect of chronological age upon academic achievement tends to outweigh the data that suggest negligible influence. Yet contradictory data suggest that before one accepts this as conclusive, caution should prevail.

Beattie (1970) speculated that chronological age was not as significant as some educators believe. Halliwell and Stein (1964) found that even though early entrants were significantly poorer in achievement than were late entrants of comparable sex and I.Q., the early entrants were significantly above grade level placement. Baer (1958) in summary cautioned that before concluding that an underage child should delay one year before entering school, it should be noted that the underage student made average progress in all areas under study.

The ultimate question appears to be what benefits would an underage child accrue if formal admission to school were delayed one year. Green and Simmons (1962) stated . . . "In terms of achievement for years of schooling there would have been some advantage in waiting; in terms of achievement for years of life there would have been some disadvantages."

Hirst (1970:549) in citing the results of Halliwell and Stein (1964) made the following statement: "Was the statistical difference worth the practical loss of a year of productive life for children required to postpone school entrance?"

Chapter 3

PRESENTATION AND ANALYSIS OF DATA

The statistical procedure analysis of variance was used in this study to examine the achievement scores on the SRA Achievement Series of 495 students from Livingston Parish, Louisiana. The students in the sample entered the first grade during the 1967-68 school year and were administered the SRA Achievement Series for the four consecutive years under study. The scores in the selected areas of achievement were categorized by sex and the quarter of the calendar year in which the student was born. The analysis was performed to determine: (1) the over-quarter differences in achievement between the sexes; (2) the over-sex differences in achievement between quarters; and (3) the interaction between sex and quarter of birth. (Are differences in achievement between the sexes consistent from quarter to quarter?)

The following null hypothesis was tested for each dependent variable: There are no statistically significant differences in the achievement scores among students born in different quarters of the same calendar year as measured by the SRA Achievement Series. F-values were computed and tested for significance at the .05 and .01 levels of confidence. An analysis of variance and table of means were presented for each dependent variable for each sex by quarter of birth.

In the analysis by year of each dependent variable, where significant differences existed, linear orthogonal comparisons were employed to determine if the regression trends were significant. A value for Q^2 was computed for each dependent variable by year, and

F-values were computed by dividing Q^2 by the mean square error of that variable. A significant linear relationship indicated that the regression had a straight line relationship which was displayed by graph.

Table 1 indicates the distribution of the 495 students by quarter of birth and sex. In the variance procedure used in this study, the number of students in each group was statistically equalized. The mean scores which were displayed in the tables were the true means rather than the adjusted means since the actual differences between the two were negligible.

Table 1

Distribution of 495 Students by Quarter of Birth and Sex

Quarter of Birth	Male	Female	Total
1	59	72	131
2	49	68	117
3	75	62	137
4	54	56	110

ACHIEVEMENT OF STUDENTS IN GRADE ONE

Table 2 was prepared in order to present data derived from the analysis of variance for the dependent variables arithmetic reasoning, arithmetic concepts, arithmetic computation and arithmetic.

Achievement in Arithmetic Reasoning

An F-value of 3.853 was indicated by Table 2 for the dependent variable arithmetic reasoning when quarter of birth was used as the

Table 2

Analysis of Variance at Grade One for Dependent Variables Reasoning, Concepts, Computation and Arithmetic

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Reasoning	Quarter	3	737.805	3.853**
	Sex	1	2.577	0.040
	Q*S	3	38.892	0.203
Concepts	Quarter	3	239.779	2.965*
	Sex	1	1.573	0.058
	Q*S	3	45.520	0.563
Computation	Quarter	3	850.244	2.452
	Sex	1	552.411	4.779*
	Q*S	3	744.927	2.145
Arithmetic	Quarter	3	5071.814	4.333**
	Sex	1	383.591	0.983
	Q*S	3	1271.296	1.087

*Significant at the .05 level of confidence
**Significant at the .01 level of confidence

source of variation. This value was significant at the .01 level of confidence. Significance at the .01 level of confidence means that the probability of an F-value with a magnitude of 3.853 occurring by chance is one in a hundred.

An examination of the following mean arithmetic reasoning scores indicated that mean achievement decreased from quarter one to quarter four.

1	20.694
2	18.120
3	18.263
4	17.454

In order to determine if a significant linear trend existed, a linear orthogonal comparison was employed. A check of the computed F-value revealed that the linear effect was significant having an F-value of 8.858. This value was significant at the .01 level of confidence. The mean arithmetic reasoning scores by quarter of birth were displayed in Figure 1. This effect was interpreted to mean that as the quarter of the year increased, the mean arithmetic reasoning scores decreased in a straight line regression.

When the total variance for authentic reasoning was partitioned, sex, as the source of variation, yielded an F-value of 0.04. These data did not justify the rejection of the null hypothesis. The mean arithmetic reasoning scores by sex were:

Male	18.705
Female	18.682

The distribution of these means by sex for each quarter of birth were displayed in Table 3.

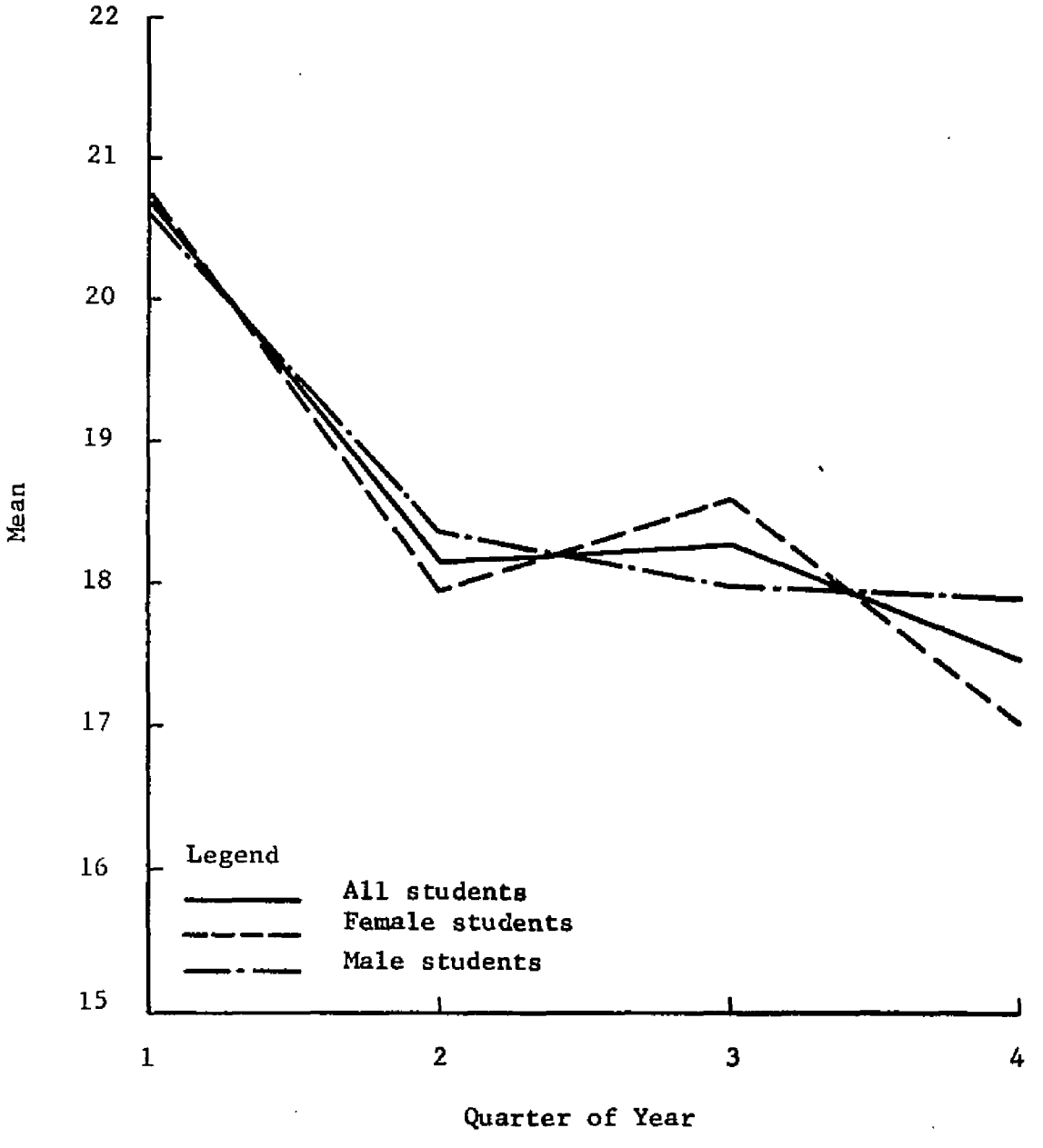

Figure 1

Mean Arithmetic Reasoning Scores
by Quarters in Grade One

Table 3

Mean Arithmetic Scores in Grade One Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Reasoning	Concepts	Computation	Arithmetic
1	M	20.694	18.374	38.359	77.420
	F	20.750	18.167	38.903	77.819
2	M	18.120	17.573	37.137	72.803
	F	17.941	17.603	39.632	75.132
3	M	18.163	17.015	35.190	70.467
	F	18.597	17.435	36.564	72.597
4	M	17.454	16.482	34.991	68.745
	F	17.018	16.071	34.429	67.161

The interaction between quarter and sex produced an F-value of 0.203 which was not sufficiently large to justify the rejection of the null hypothesis. This was interpreted to mean that the differences in the achievement scores between the sexes were consistent from quarter to quarter. The mean arithmetic reasoning scores by sex for each quarter of birth were graphed and displayed in Figure 1.

Achievement in Arithmetic Concepts

An F-value of 2.965 was obtained for quarter differences in the achievement of arithmetic concepts. This value, displayed in Table 2, was large enough to justify the rejection of the null hypothesis at the .05 level of confidence. The mean arithmetic concept scores by quarter of birth were:

1	18.374
2	17.573
3	17.015
4	16.482

An examination of these means indicated that the mean concept scores decreased as the quarter of the year increased. The F-value of the linear orthogonal comparison was 8.91 which indicated that the decrease in the mean concept scores was significant at the .01 level of confidence.

The analysis of the overall sex differences yielded an F-value of 0.058. This value, displayed in Table 2, was not large enough to justify the rejection of the null hypothesis. The mean arithmetic concept scores by sex were:

Male	18.705
Female	18.682

An F-value of 0.203 for the interaction between quarter of birth and sex was not sufficiently large to justify the rejection of the null hypothesis. This was interpreted to mean that the differences in the achievement between the sexes was consistent from quarter to quarter. The mean arithmetic concept scores by sex for each quarter of birth are displayed graphically in Figure 2.

Achievement in Arithmetic Computation

An examination of Table 2 concerning dependent variable arithmetic computation where quarter of birth was used as the source of variation showed an F-value of 2.45. This value was not of sufficient magnitude to justify the rejection of the null hypothesis. Mean arithmetic computation scores for the quarter effect were:

1	38.359
2	37.137
3	35.190
4	34.991

However, when sex was used as a source of variation, an F-value of 4.779 was obtained. This value was significant at the .05 level of confidence. The mean arithmetic computation scores by sex for grade one were:

Male	35.230
Female	37.562

This was interpreted to mean that the mean score for female students was significantly higher than that for male students.

An F-Value of 2.148 was computed for the interaction between quarter of birth and sex. This value was not of sufficient magnitude to

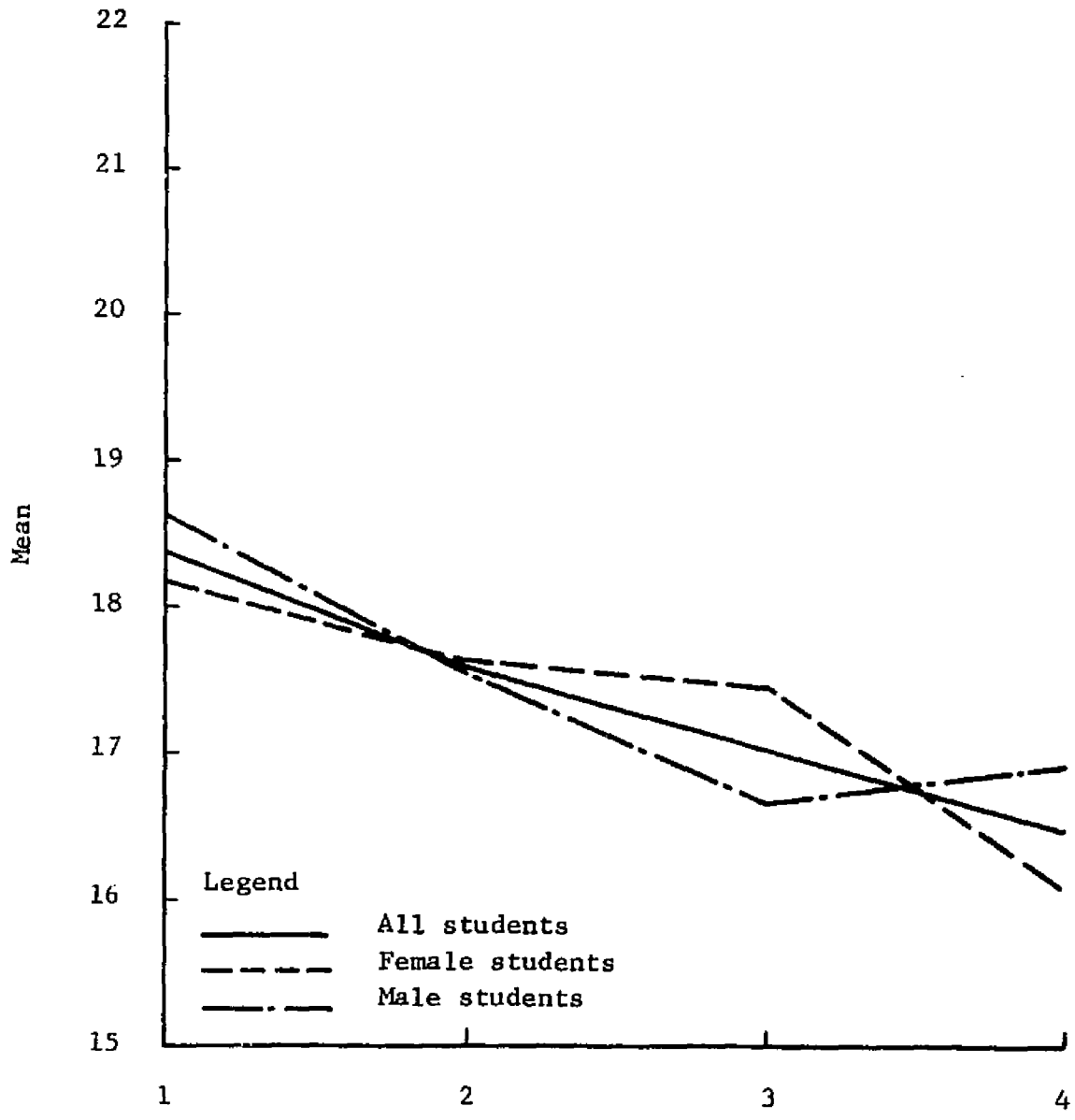

Figure 2

Mean Arithmetic Concept Scores
by Quarters in Grade One

warrant the rejection of the null hypothesis. The mean arithmetic computation scores by sex for each quarter of birth were graphed and displayed in Figure 3.

Achievement in Arithmetic

The composite score arithmetic was derived from the summation of the values from the arithmetic reasoning, arithmetic concepts and arithmetic computation sub-tests for each student in the sample. The analysis of variance for arithmetic produced an F-value of 4.33 when quarter of birth was used as the source of variation. This value was of sufficient magnitude to justify the rejection of the null hypothesis at the .01 level of confidence. Arithmetic means for the quarter effect were:

1	77.420
2	72.803
3	70.467
4	68.745

An examination of these means showed a decrease in the mean arithmetic scores as the quarter of the year progressed. By using a linear orthogonal comparison it was determined that the linear trend was significant at the .01 level of confidence, having an F-value of 12.74.

The analysis of overall sex differences in the achievement in arithmetic yielded an F-value of 0.983 which was not of sufficient size to justify the rejection of the null hypothesis. The mean arithmetic scores by sex were:

Male	71.316
Female	73.542

When the analysis of the interaction between quarter of birth and sex was performed, an F-value of 1.087 was obtained. This value did not

meet the test of significance at either the .05 or .01 levels of confidence. The mean arithmetic scores by sex for each quarter of birth were graphically displayed in Figure 4.

Achievement in Reading Comprehension

An F-value of 0.661 was obtained when the analysis was performed using quarter of birth as the source of variation. This value, as shown in Table 4 was not of sufficient size to justify the rejection of the null hypothesis. The mean reading comprehension scores by quarter of birth were:

1	14.618
2	13.744
3	14.015
4	13.900

However, when the analysis was completed using sex as a source of variation, an F-value of 9.635 was obtained. This value, displayed in Table 4, was sufficiently large to warrant the rejection of the null hypothesis at the .01 level of confidence. The mean reading comprehension scores by sex were:

Male	13.245
Female	14.857

This was interpreted to mean that in grade one the mean reading comprehension score for female students was significantly higher than the mean reading comprehension score for male students. Achievement means by sex for each quarter of birth are presented in Table 5.

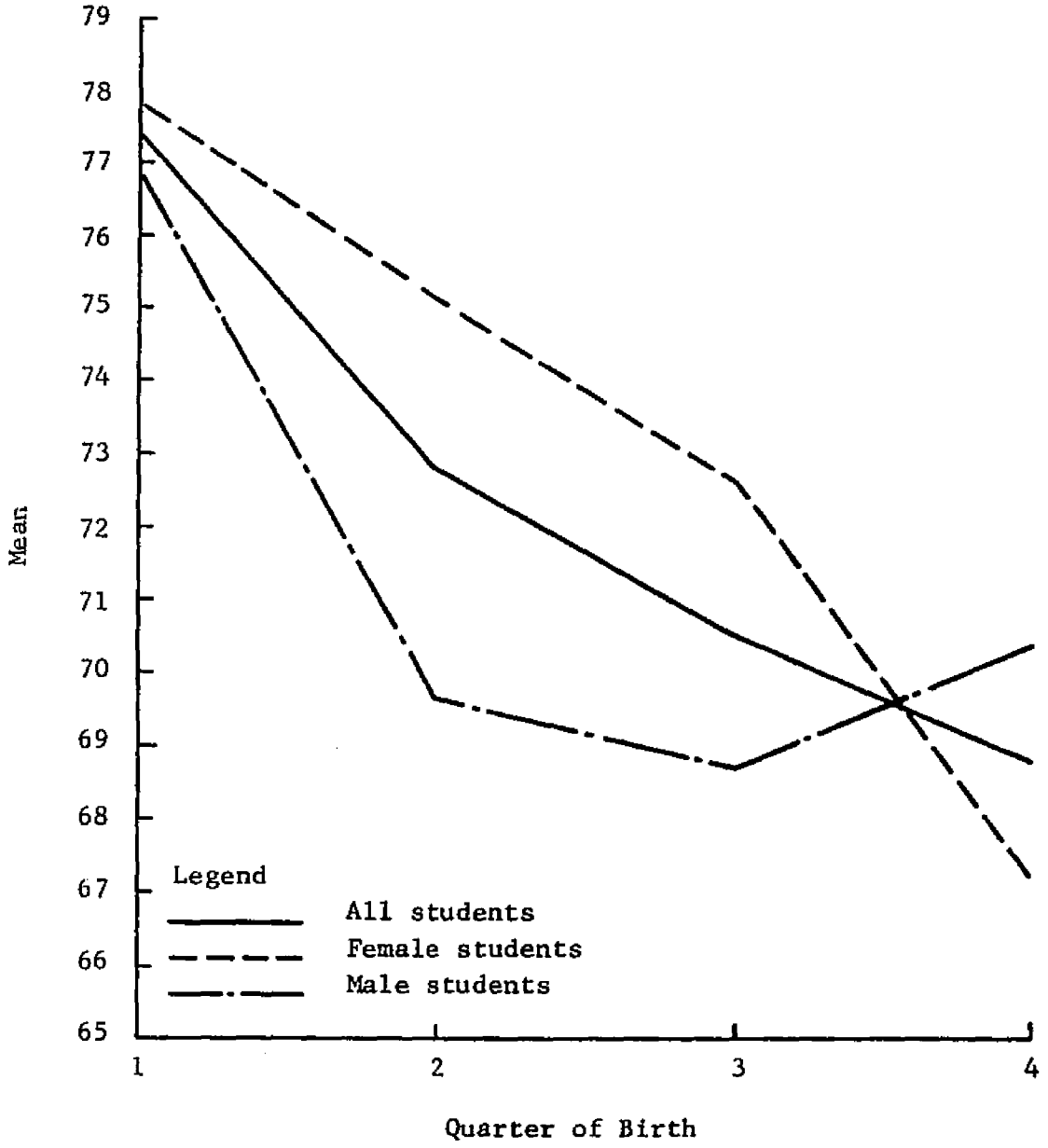

Figure 4

Mean Arithmetic Scores
by Quarters in Grade One

Table 4

Analysis of Variance at Grade One for Dependent Variables Comprehension, Vocabulary and Reading

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Comprehension	Quarter	3	70.209	0.661
	Sex	1	341.190	9.635**
	Q*S	3	62.901	0.592
Vocabulary	Quarter	3	99.849	0.993
	Sex	1	1.221	0.040
	Q*S	3	62.012	0.693
Reading	Quarter	3	8569.724	2.755**
	Sex	1	16044.572	15.473**
	Q*S	3	379.909	0.122

**Significant at the .01 level of confidence

Table 5

Mean Reading Scores in Grade One Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Comprehension	Vocabulary	Reading
1	M	14.170	10.780	125.762
	F	14.986	10.556	136.570
2	M	12.204	8.816	118.204
	F	14.853	10.147	127.559
3	M	13.480	10.387	115.720
	F	14.661	9.855	127.129
4	M	12.852	10.407	113.926
	F	14.910	10.232	128.339

When the analysis of the interaction between quarter and sex was performed, an F-value of 0.592 was obtained. This value, found in Table 4, was not of sufficient size to justify the rejection of the null hypothesis. Mean reading comprehension scores by sex for each quarter of birth were graphed and displayed in Figure 5.

Achievement in Reading Vocabulary

Table 4 presents the results of the analysis of variance of reading vocabulary. The F-values computed for each of the three sources of variation, quarter of birth, sex, and quarter by sex interaction, were not of sufficient magnitude to justify the rejection of the null hypothesis. The F-values for each were as follows:

Quarter of birth	0.993
Sex	0.040
Quarter by sex interaction	0.693

Table 4 indicates the mean reading vocabulary scores for each sex by quarter of birth. Mean reading vocabulary scores for the quarter effect were:

1	10.657
2	9.590
3	10.146
4	10.318

Mean scores by sex for each quarter of birth were presented graphically in Figure 6.

Achievement in Reading

As indicated in Table 4, the analysis of the composite reading scores yielded significance in two of the sources of variation, quarter

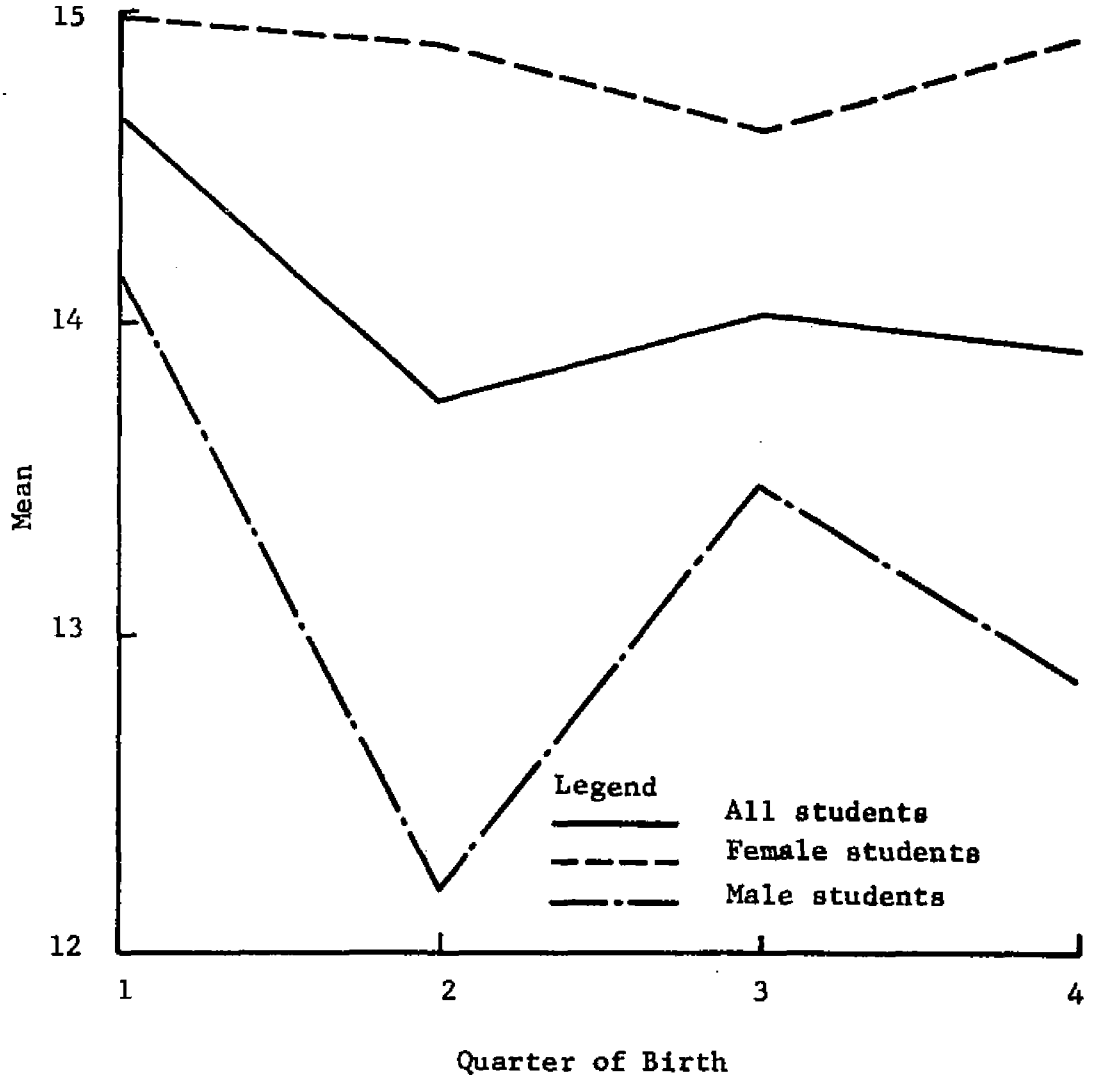

Figure 5

Mean Reading Comprehension Scores
by Quarters in Grade One

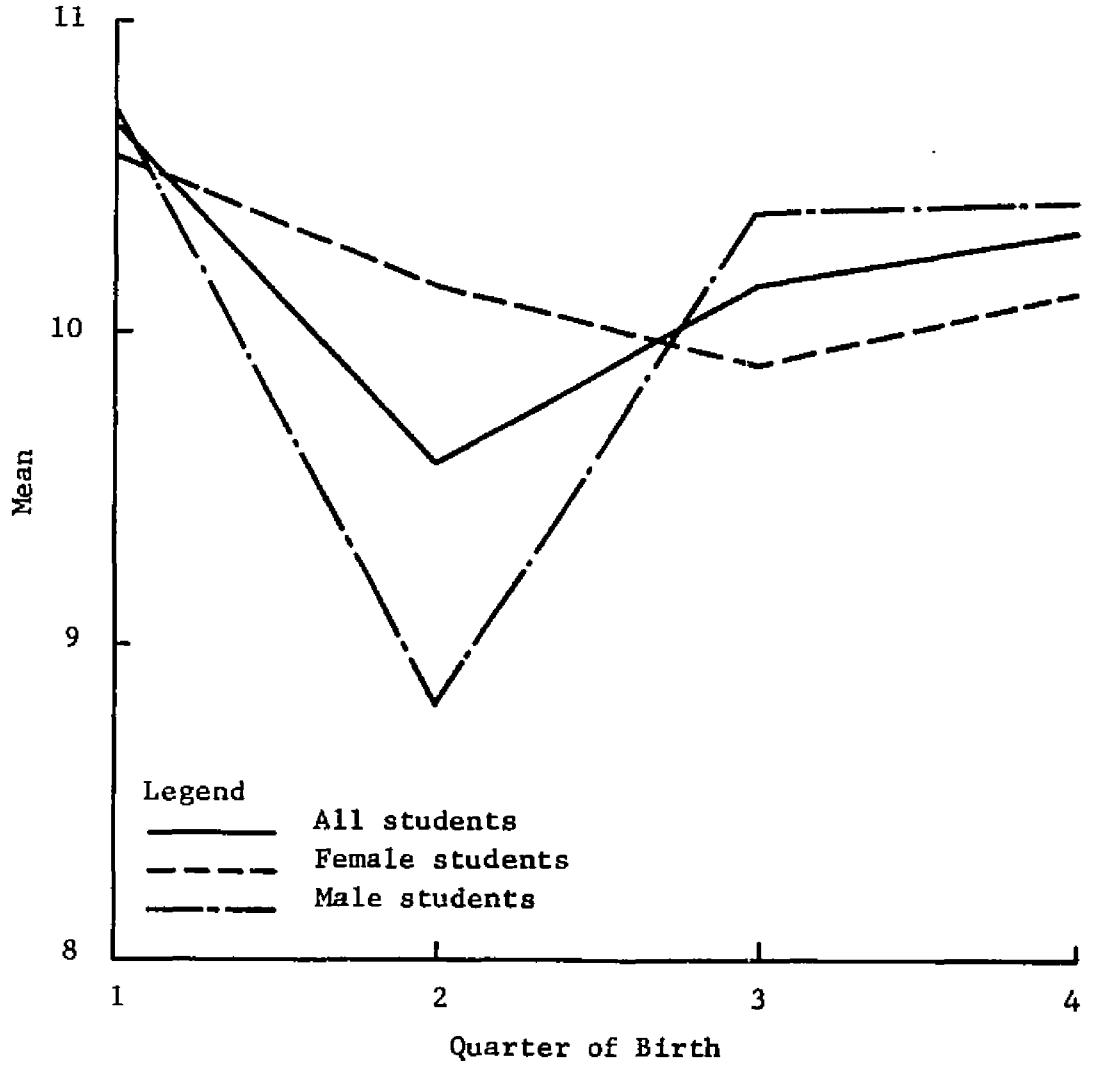

Figure 6

Mean Reading Vocabulary Scores
by Quarters in Grade One

of birth and sex. Quarter of birth as the source of variation produced an F-value of 2.755 which was significant at the .05 level of confidence. The quarterly reading means were:

1	131.702
2	123.641
3	120.883
4	121.264

The F-value of the linear orthogonal comparison, 6.93, was significant at the .01 level of confidence indicating that a significant decreasing linear trend existed. The quarterly values were graphically displayed in Figure 7.

The F-value, 15.473, obtained for the sex effect was significant at the .01 level of confidence. The mean reading scores by sex for grade one were:

Male	118.325
Female	130.140

Mean reading scores by sex in each quarter of birth were presented in Table 5.

An F-value of 0.122 for the interaction effect was not of sufficient magnitude to warrant the rejection of the null hypothesis. Figure 7 displays the mean reading achievement scores.

ACHIEVEMENT OF STUDENTS IN GRADE TWO

Achievement in Arithmetic Reasoning

The quarter effect in grade two continued to be significant for this dependent variable as it was in grade one. The F-value of 5.826, as indicated in Table 6, was significant at the .01 level of confidence.

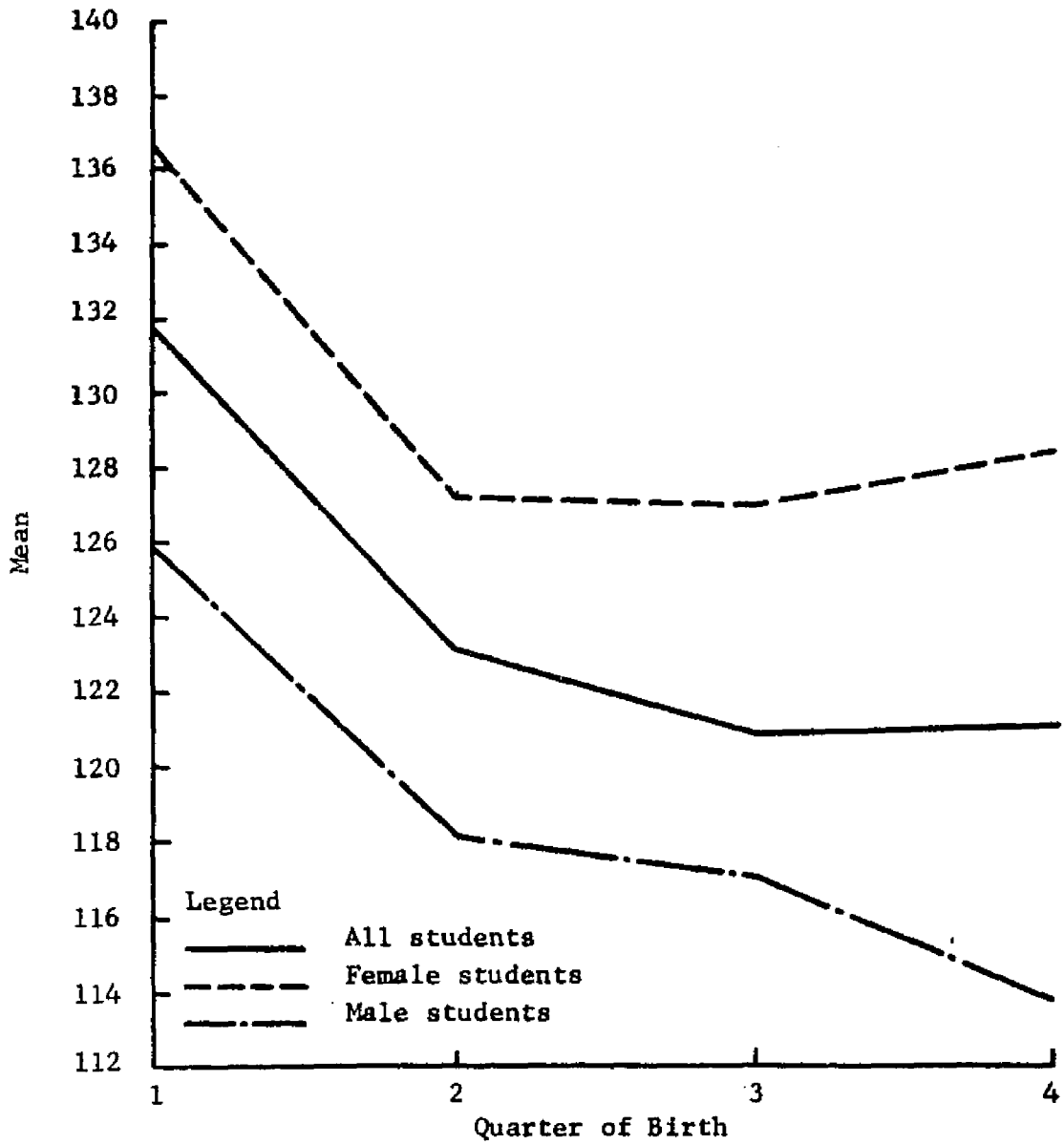

Figure 7

Mean Reading Achievement Scores
by Quarters in Grade One

Table 6

Analysis of Variance at Grade Two for Dependent Variables Reasoning, Concepts, Computation and Arithmetic

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Reasoning	Quarter	3	1428.605	5.826**
	Sex	1	10.752	0.132
	Q*S	3	85.809	0.350
Concepts	Quarter	3	290.940	5.019**
	Sex	1	43.583	2.255
	Q*S	3	77.809	1.342
Computation	Quarter	3	898.396	3.766**
	Sex	1	180.969	2.276
	Q*S	3	210.079	0.881
Arithmetic	Quarter	3	6678.712	6.243**
	Sex	1	114.879	0.322
	Q*S	3	925.173	0.865

**Significant at the .01 level of confidence

The F-value of the linear orthogonal comparison was determined to be 15.03, which indicated that the decreasing linear effect was still significant. The mean arithmetic reasoning scores by quarter of birth were:

1	32.099
2	30.496
3	28.022
4	28.227

These values were graphed and displayed in Figure 8.

An inspection of Table 6 revealed that the difference in the achievement of arithmetic reasoning by sex failed to meet the test for significance at either the .05 level of confidence or the .01 level of confidence. The F-value of 0.132 was not of sufficient magnitude to warrant the rejection of the null hypothesis. Mean arithmetic reasoning scores by sex were:

Male	29.430
Female	30.008

Mean arithmetic reasoning scores by sex for each quarter of birth were presented in Table 7.

An F-value of 0.350 for the interaction between quarter of birth and sex was not sufficiently large to justify the rejection of the null hypothesis. The mean arithmetic reasoning scores by sex for each quarter of birth were graphically presented in Figure 8.

Achievement in Arithmetic Concpets

Table 6 revealed an F-value of 5.019 for the dependent variable arithmetic concepts when quarter of birth was used as the source of

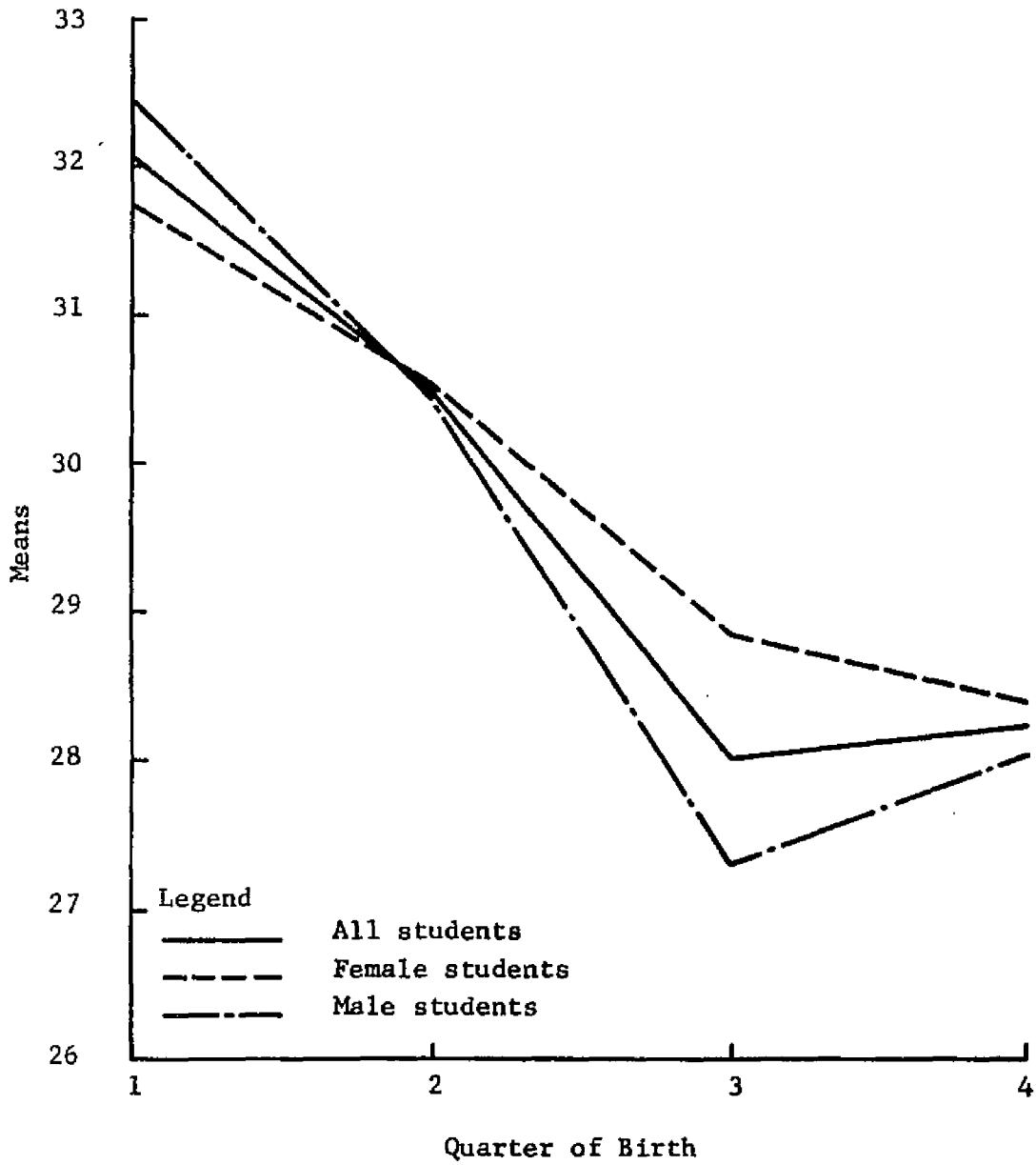

Figure 8

Mean Arithmetic Reasoning Scores
by Quarters in Grade Two

Table 7

Mean Arithmetic Scores in Grade Two Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Reasoning	Concepts	Computation	Arithmetic
1	M	32.491	21.085	49.881	103.458
	F	31.778	20.486	49.458	101.722
2	M	30.470	21.775	47.939	100.184
	F	30.515	20.132	48.735	99.382
3	M	27.333	19.427	44.720	91.480
	F	28.855	20.000	47.790	96.645
4	M	28.056	19.389	46.185	93.648
	F	28.393	18.660	47.625	94.911

variation. This value, significant at the .01 level of confidence indicated that the quarter effect was still significant in grade two as it was in grade one. An examination of the following quarterly means indicated that a decrease in arithmetic concept means occurred from quarter one to quarter four.

1	20.756
2	20.821
3	19.686
4	19.018

A slight increase in the mean score occurred in quarter two, but a check of the F-value of the linear orthogonal comparison, 12.91, revealed that the linear effect was significant at the .01 level of confidence.

Neither the sex effect nor the interaction effect was significant. The analysis of variance for each was displayed in Table 6. The mean arithmetic concept scores by sex were:

Male	20.317
Female	19.880

The mean concept scores by sex in each quarter of birth were displayed in Table 7.

The F-value for the quarter of birth by sex interaction, through its failure to reject the null hypothesis, indicated that sex differences in the achievement of arithmetic concepts were consistent from quarter to quarter. The mean arithmetic concept scores by quarter of birth for each sex were graphically illustrated in Figure 9.

Achievement in Arithmetic Computation

The arithmetic computation means by quarter of birth for grade two were:

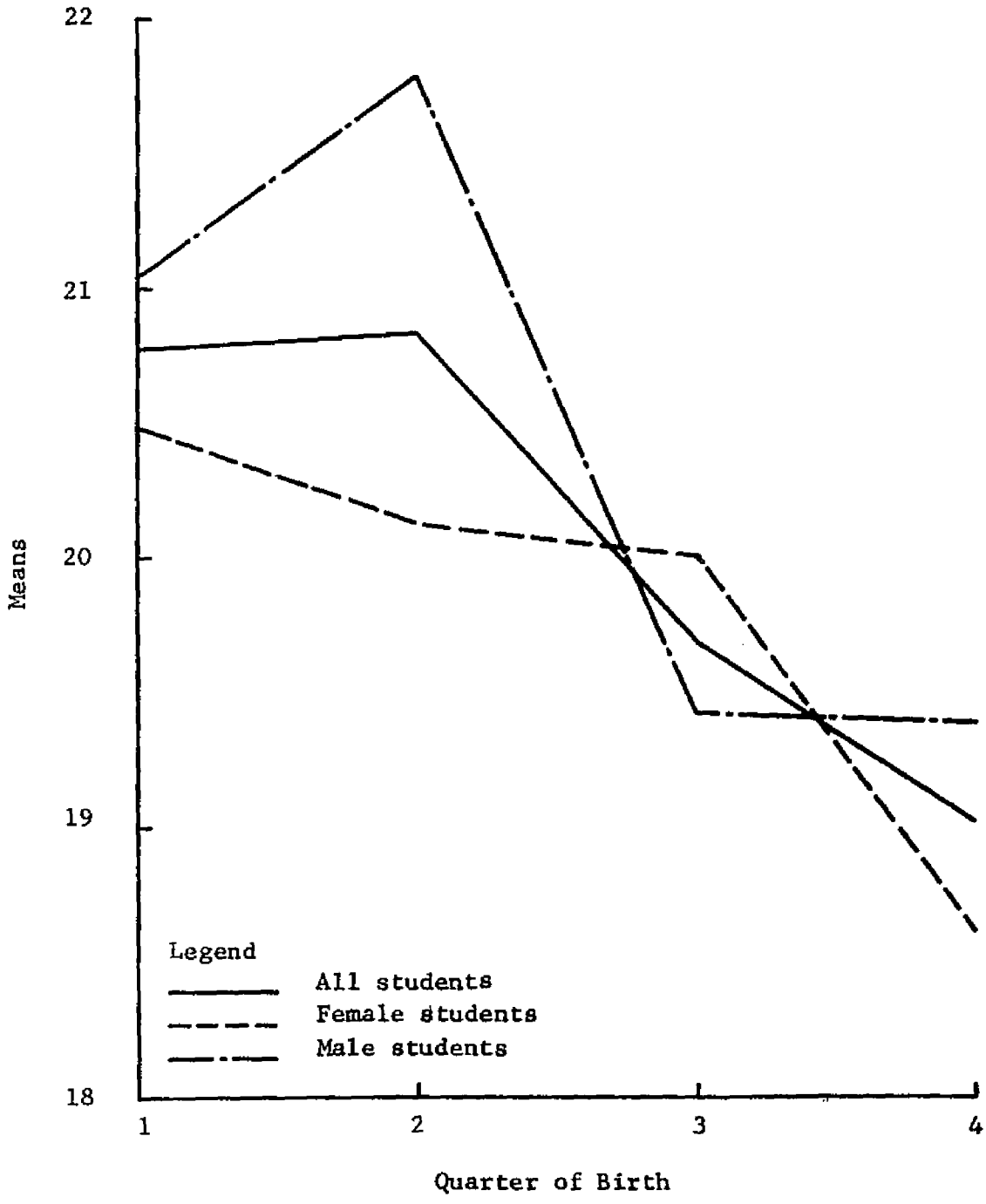

Figure 9

Mean Arithmetic Concept Scores
by Quarters in Grade Two

1	49.649
2	48.402
3	46.110
4	46.918

When the analysis was performed it produced by F-value of 3.766 which was of sufficient magnitude to warrant the rejection of the null hypothesis at the .05 level of confidence. An examination of the mean arithmetic computation scores indicated a decrease in mean achievement from quarter one to quarter four. To determine if a significant trend existed, a linear orthogonal comparison was utilized. An F-value of 8.59 was obtained thereby justifying the rejection of the null hypothesis at the .01 level of confidence. The quarterly mean achievement scores were graphed and displayed in Figure 10.

The analysis of the sex effect upon arithmetic computation produced an F-value of 2.276. This value did not meet the test for significance. Mean computation scores by sex were:

Male	47.004
Female	48.470

The distribution of these means by quarter of birth for each sex was displayed in Table 7.

The achievement differences in computation produced by sex were consistent from quarter to quarter as indicated by the interaction effect. The analysis procedure yielded an F-value of 0.881 which was not of sufficient size to warrant the rejection of the null hypothesis. Mean computation scores for each sex by quarter of birth were graphed and displayed in Figure 10.

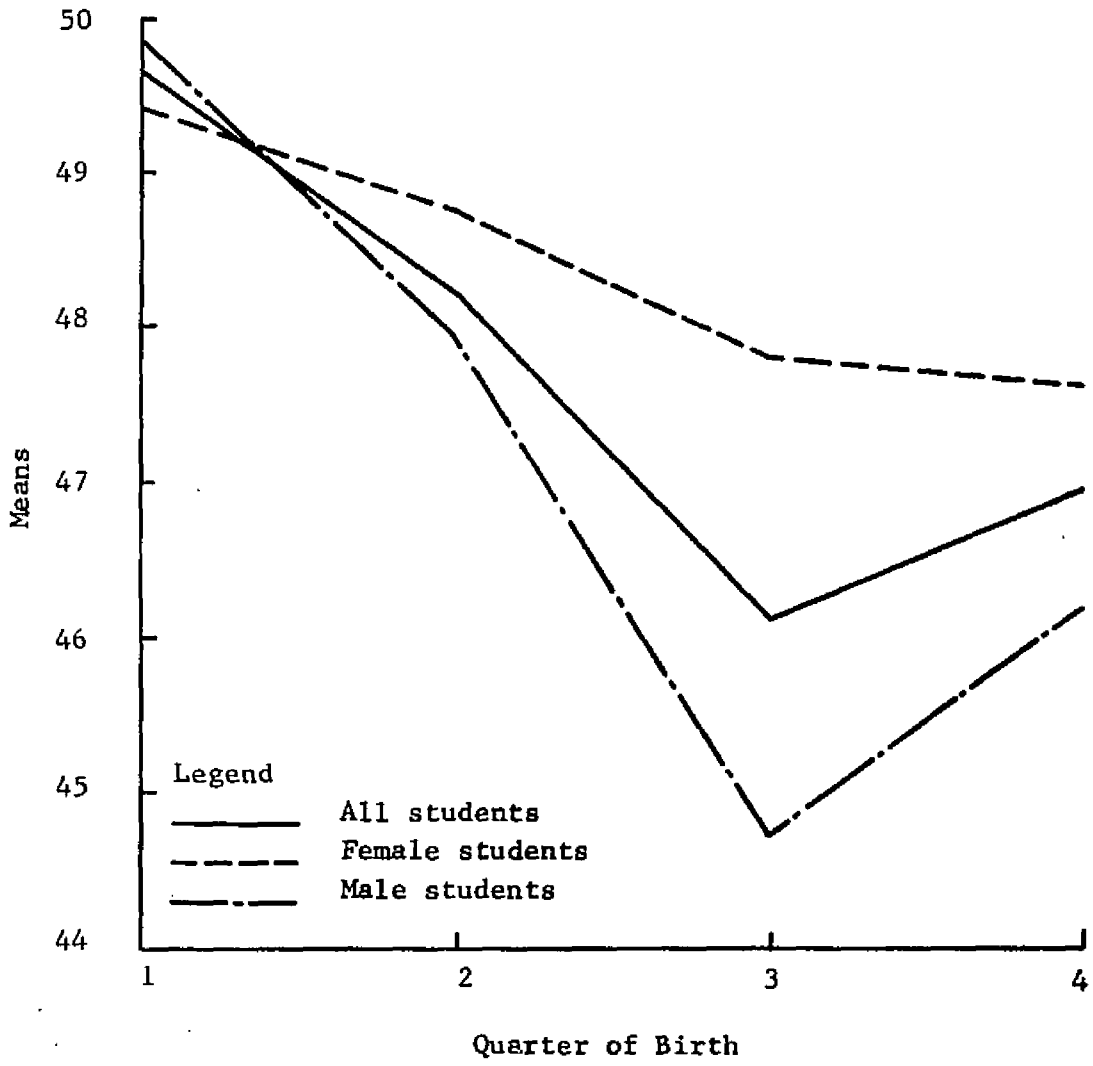

Figure 10

Mean Arithmetic Computation Scores
by Quarters in Grade Two

Achievement in Arithmetic

The F-value of 6.243 for arithmetic where quarter was used as the source of variation was significant at .01 level of confidence. The quarterly arithmetic means were:

1	102.504
2	99.718
3	93.816
4	94.291

To determine if the over-quarter decrease produced a significant linear trend, an orthogonal comparison was employed. This procedure provided an F-value of 16.141 which indicated that the linear effect was significant at the .01 level of confidence. The quarterly means were graphed and displayed in Figure 11.

Table 6 showed that the F-value for the difference in achievement of arithmetic produced by sex was insufficiently large to justify the rejection of the null hypothesis. The arithmetic means by sex for grade two were:

Male	96.755
Female	98.407

A distribution of these values by quarter of birth for each is found in Table 7.

The interaction between quarter and sex, as shown in Table 6, produced an F-value of 0.865 which was of insufficient magnitude to warrant the rejection of the null hypothesis. Mean arithmetic scores for each sex by quarter of birth were graphically depicted in Figure 11.

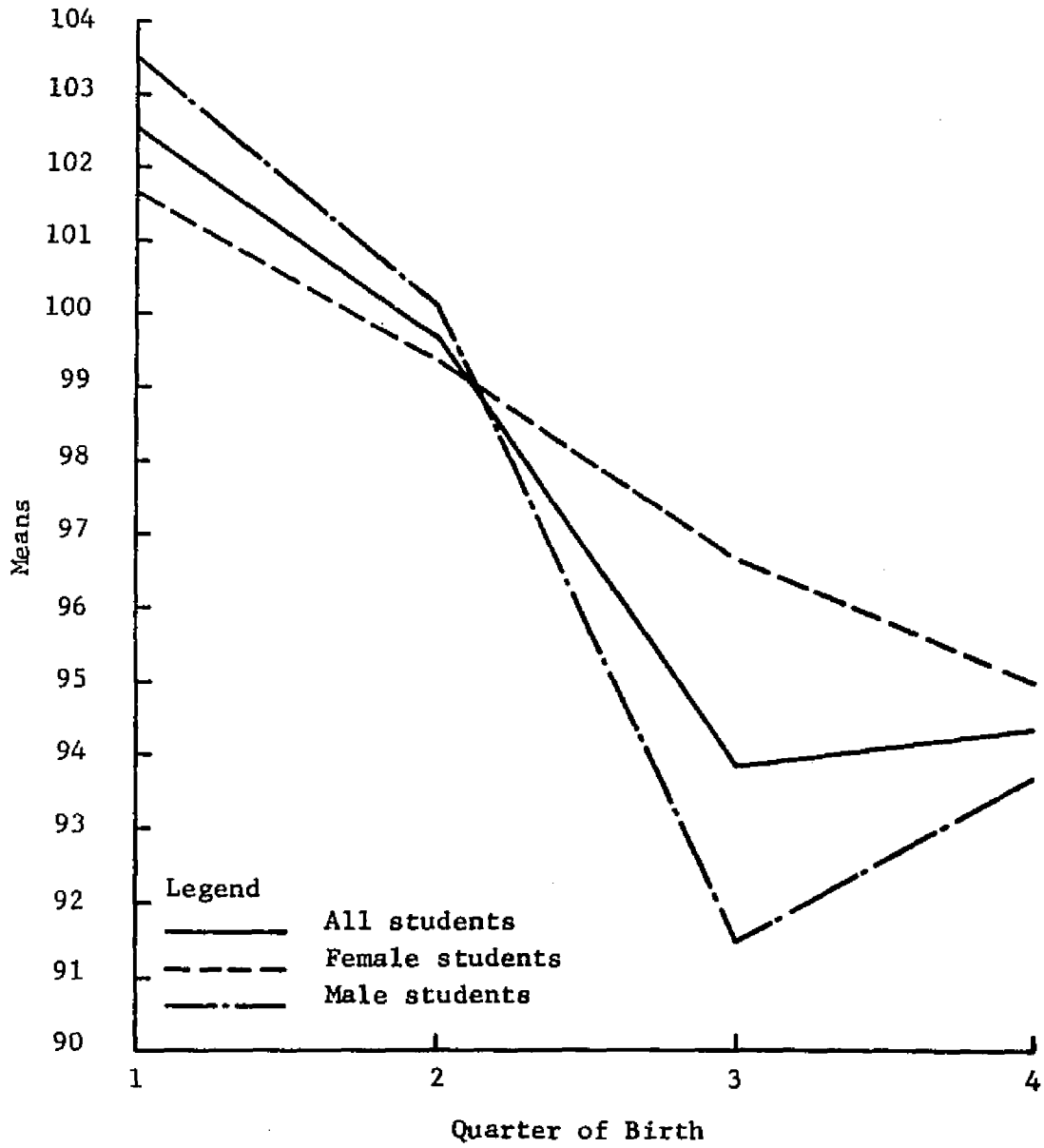

Figure 11

Mean Arithmetic Scores
by Quarters in Grade Two

Achievement in Reading Comprehension

The analysis of reading comprehension as shown in Table 8, produced significance in two sources of variation, quarter of birth and sex. Quarter, as the source of variation, yielded an F-value of 6.007 which was significant at the .01 level of confidence. An examination of the following reading comprehension means by quarter of birth revealed an over-quarter decrease.

1	25.450
2	24.974
3	21.993
4	22.500

A linear orthogonal comparison produced an F-value of 16.45 which exceeded the needed value for significance at the .01 level of confidence. The reading comprehension means by quarter of birth were graphically depicted in Figure 12.

When sex was considered as a source of variation, it revealed an F-value of 29.932 which led to the rejection of the null hypothesis at the .01 level of confidence. The reading comprehension means by sex in grade two were:

Male	21.726
Female	25.562

A distribution of these means for each sex by quarter of birth are found in Table 9.

The F-value for the interaction between quarter and sex, 0.940, failed to meet the test for significance at either the .05 or .01 levels of confidence. The reading comprehension means by quarter of birth for each sex were graphed and displayed in Figure 12.

Table 8

Analysis of Variance at Grade Two for Dependent Variables Comprehension, Vocabulary and Reading

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Comprehension	Quarter	3	959.471	6.007**
	Sex	1	1575.337	29.932**
	Q*S	3	246.400	1.561
Vocabulary	Quarter	3	613.736	4.025**
	Sex	1	1009.236	19.855**
	Q*S	3	42.589	0.279
Reading	Quarter	3	22027.972	6.463**
	Sex	1	18161.461	15.987**
	Q*S	3	3204.106	0.940

**Significant at the .01 level of confidence

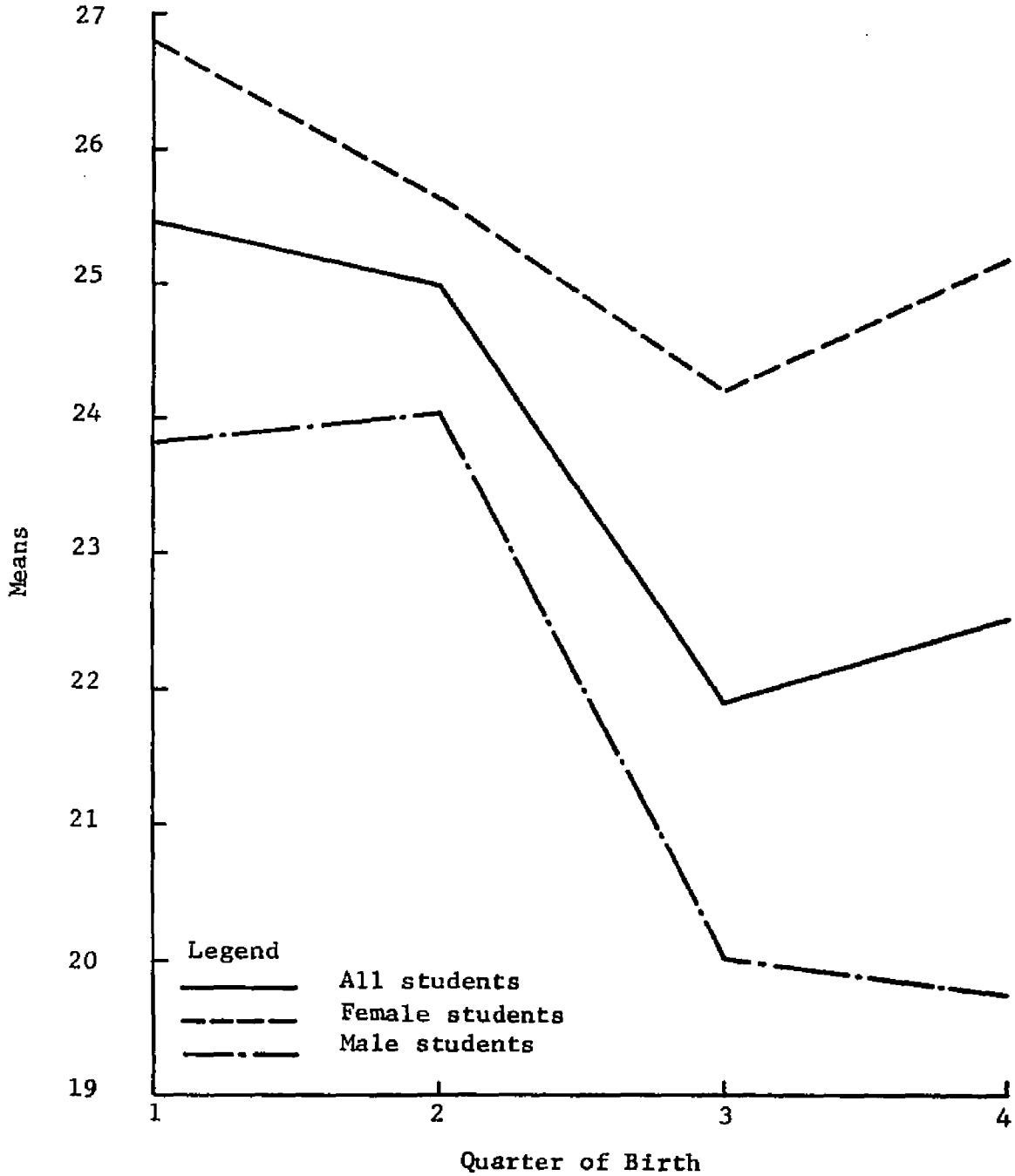

Figure 12

Mean Reading Comprehension Scores
by Quarters in Grade Two

Table 9

Mean Reading Scores in Grade Two Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Comprehension	Vocabulary	Reading
1	M	23.814	16.797	168.949
	F	26.792	20.028	182.083
2	M	24.061	15.674	169.184
	F	25.632	18.353	172.971
3	M	20.000	14.573	149.973
	F	24.403	16.613	167.758
4	M	19.722	14.185	155.907
	F	25.179	17.768	170.125

Achievement in Reading Vocabulary

A study of Table 8 for the dependent variable reading vocabulary revealed significance in two sources of variation, quarter of birth and sex. The quarter effect produced an F-value of 4.025 while the sex effect yielded an F-value of 19.855, both of which were significant at the .01 level of confidence.

The quarterly reading vocabulary means were as follows:

1	18.573
2	17.231
3	15.496
4	16.009

An orthogonal comparison revealed that the over-quarter decrease in the mean scores was significant and generally occurred in a straight line regression. The F-value of 10.17 indicated a significant difference at the .01 level of confidence. The quarterly means for reading vocabulary were graphically displayed in Figure 13.

Sex, as the source of variation, was significant at the .01 level of confidence. The reading vocabulary means by sex were:

Male	15.266
Female	18.275

An F-value of 0.279 was obtained for the interaction between quarter of birth and sex. This value failed to reject the hypothesis of no difference in achievement between the sexes. Mean reading vocabulary scores by quarter of birth for each sex were graphed and displayed in Figure 13.

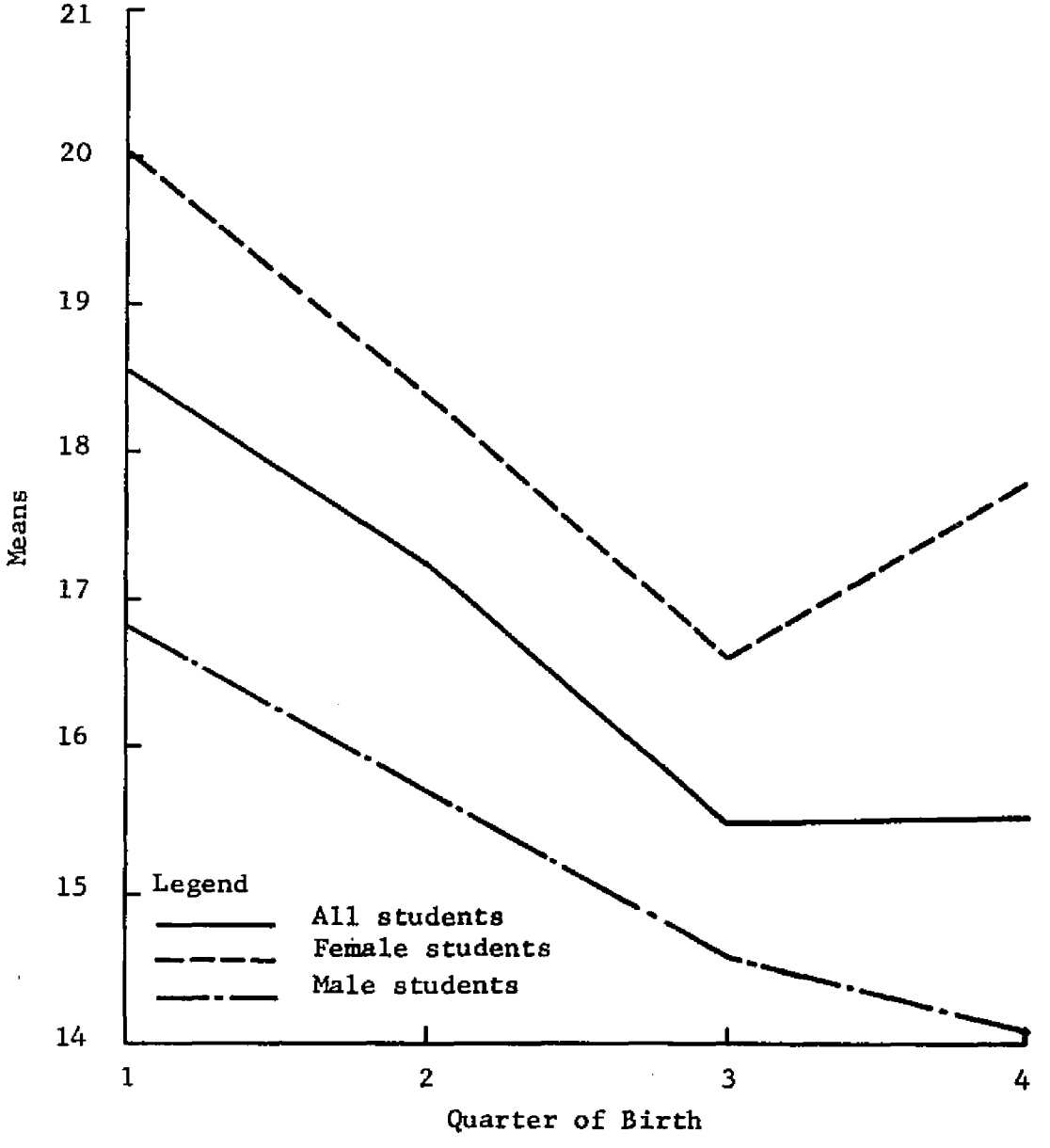

Figure 13

Mean Reading Vocabulary Scores
by Quarters in Grade Two

Achievement in Reading

An F-value of 6.463 was obtained for reading achievement where quarter of birth was used as a source of variation. This value was of sufficient magnitude to reject the null hypothesis at the .01 level of confidence. Quarterly means for reading achievement in grade two were:

1	176.168
2	171.385
3	158.022
4	163.146

A linear orthogonal comparison revealed that the decrease in the mean reading achievement scores from quarter one to quarter four approximated a straight-line regression. This procedure yielded an F-value of 14.97 which was found to be significant at the .01 level of confidence.

The sex effect proved significant when the analysis produced an F-value of 15.987. This value was significant at the .01 level of confidence. Reading means by sex for grade two were:

Male	160.021
Female	173.643

Table 8 disclosed an F-value of 0.940 for the interaction between quarter of birth and sex. This value failed to reject the null hypothesis. Mean reading scores by quarter of birth and sex were graphed and presented in Figure 14.

ACHIEVEMENT OF STUDENTS IN GRADE THREE

The presentation of the Arithmetic variables changed in year three of this study. In grade three, the Modern Math for Understanding option of the SRA Achievement Series was exercised in lieu of the

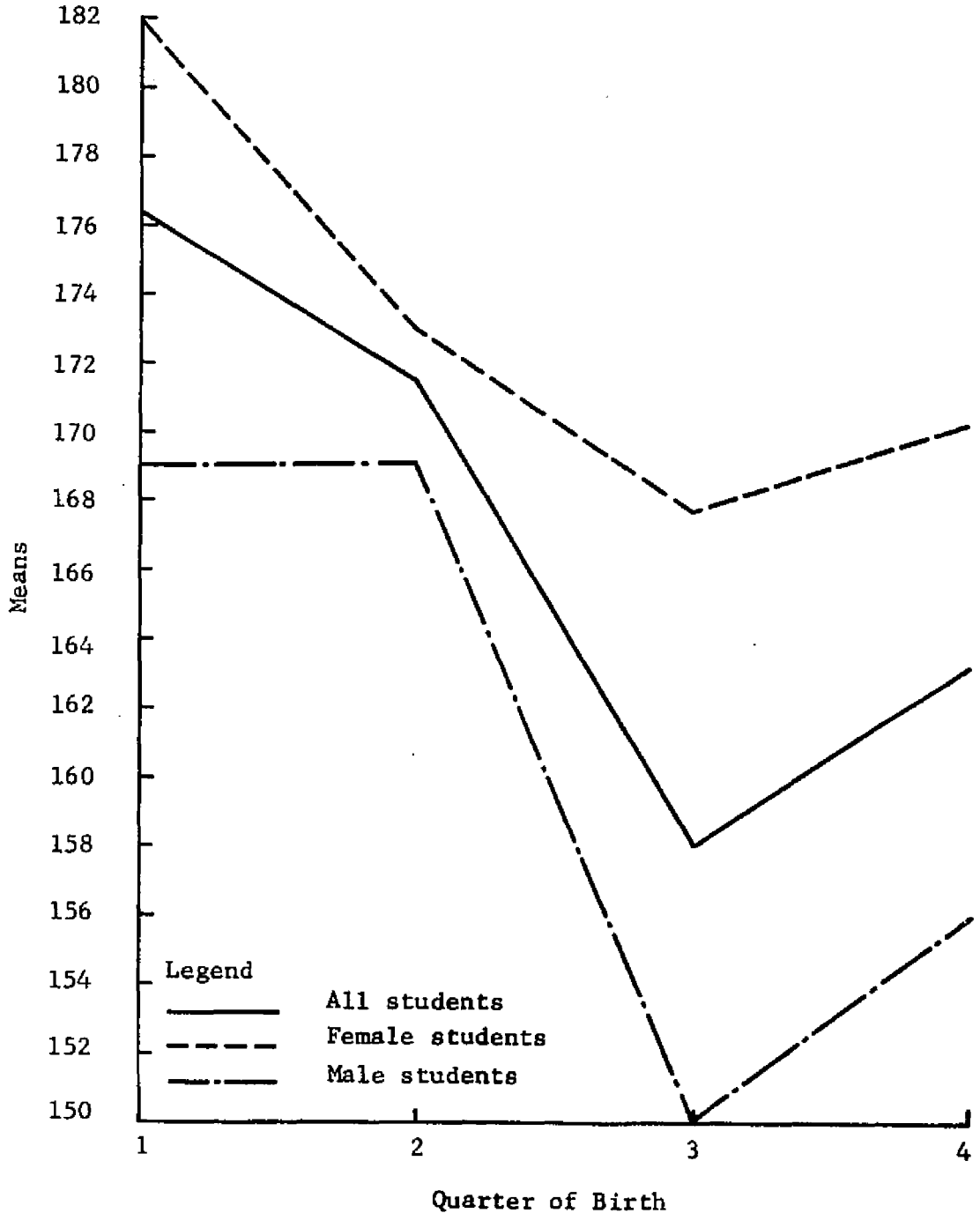

Figure 14

Mean Reading Achievement Scores
by Quarters in Grade Two

traditional sub-tests in the arithmetic battery. Hence, only one dependent variable, Arithmetic, will be utilized in the concluding two years of the study.

Achievement in Arithmetic

An analysis of the dependent variable arithemtic revealed no significance among the three sources of variation under study. Table 10 indicated the F-values for the following sources of variation:

Quarter	1.768
Sex	0.002
Q*S	0.147

None of the above values were sufficiently large to meet the test for significance at either the .05 or .01 levels of confidence. Arithmetic means by quarter of birth were:

1	18.298
2	18.017
3	16.942
4	16.364

Mean arithmetic achievement scores at grade three by sex were:

Male	17.367
Female	17.487

A distribution of these values by quarter of birth for each sex was illustrated in Table 11, and graphically displayed in Figure 15.

Achievement in Reading Comprehension

An examination of Table 10 revealed that the quarter effect was not significant in the achievement in reading comprehension. The F-value

Table 10

Analysis of Variance at Grade Three for Dependent Variables Arithmetic, Comprehension, Vocabulary and Reading

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Arithmetic	Quarter	3	300.497	1.768
	Sex	1	0.125	0.002
	Q*S	3	25.030	0.147
Comprehension	Quarter	3	289.236	2.267
	Sex	1	399.777	9.400**
	Q*S	3	130.794	1.025
Vocabulary	Quarter	3	92.842	0.887
	Sex	1	379.043	10.857**
	Q*S	3	53.970	0.676
Reading	Quarter	3	597.573	1.583
	Sex	1	1811.874	14.403**
	Q*S	3	197.985	0.525

**Significant at the .01 level of confidence

Table 11

Mean Arithmetic and Reading Scores in Grade Three Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Arithmetic	Reading		
			Comprehension	Vocabulary	Total
1	M	18.679	21.983	15.339	36.559
	F	17.986	22.903	18.181	41.681
2	M	17.878	21.735	16.878	38.612
	F	18.118	22.573	18.015	40.588
3	M	16.920	19.547	15.640	35.187
	F	16.968	21.564	17.016	38.532
4	M	16.093	19.500	15.537	35.222
	F	16.625	22.982	17.250	40.232

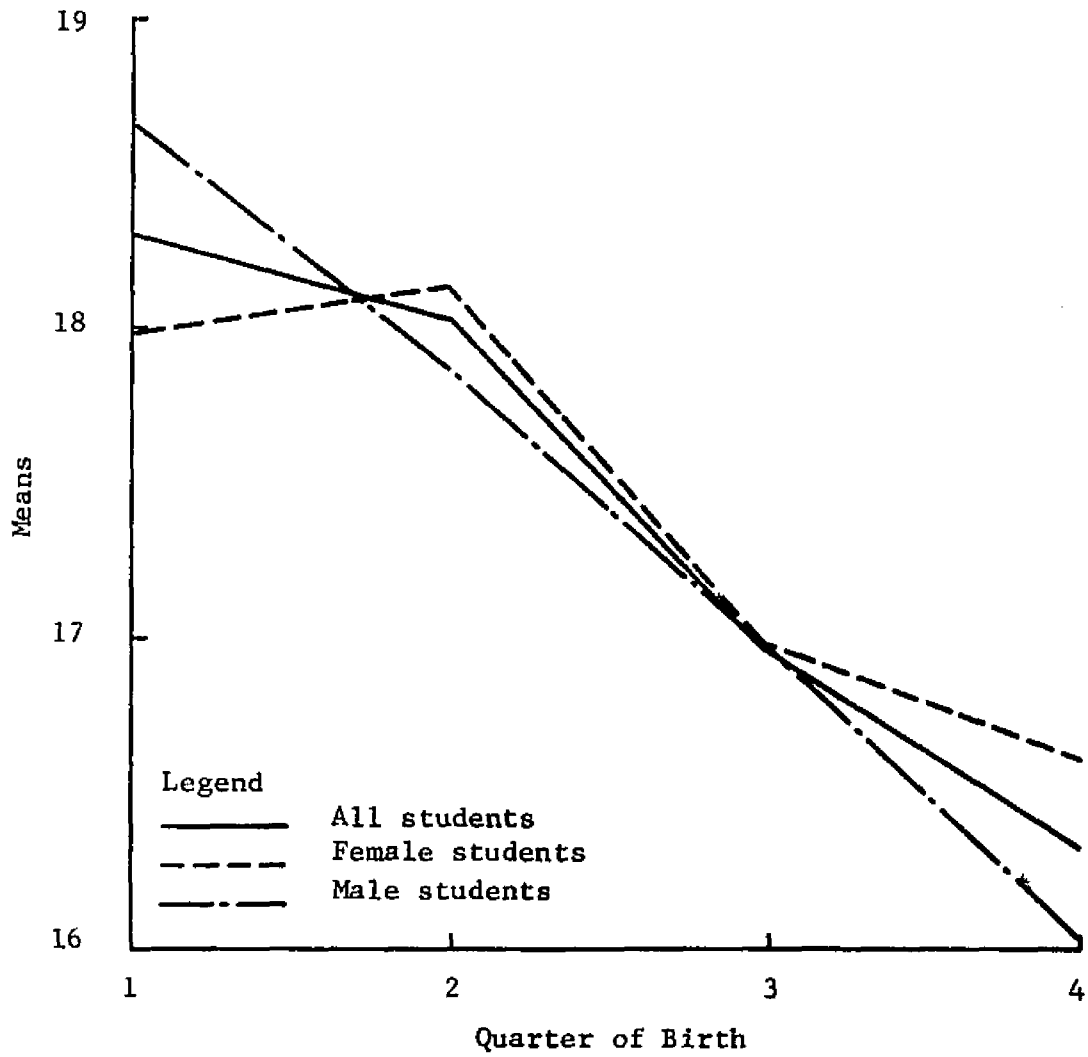

Figure 15

Mean Arithmetic Achievement Scores
by Quarters in Grade Three

of 2.267 was not sufficiently large to reject the null hypothesis. The mean reading comprehension scores by quarter of birth were:

1	22.489
2	22.222
3	20.460
4	21.273

These values were graphed and presented in Figure 16.

However, when sex was considered as a source of variation, it was found to be significant at the .01 level of confidence. An F-value of 9.400 led to the rejection of the null hypothesis. Mean comprehension scores by sex were:

Male	20.595
Female	22.512

A distribution of the mean scores by quarter of birth for each sex is displayed in Table 11.

An analysis of the interaction between quarter and sex produced an F-value of 1.025 which failed to reject the null hypothesis. A graph of the mean comprehension scores by quarter of birth for each sex was presented in Figure 16.

Achievement in Reading Vocabulary

The analysis of reading vocabulary revealed significance in only one source of variation, sex. The quarter effect, as indicated in Table 10, produced an F-value of 0.887 which failed to reject the null hypothesis. Means by quarter of birth for reading vocabulary were:

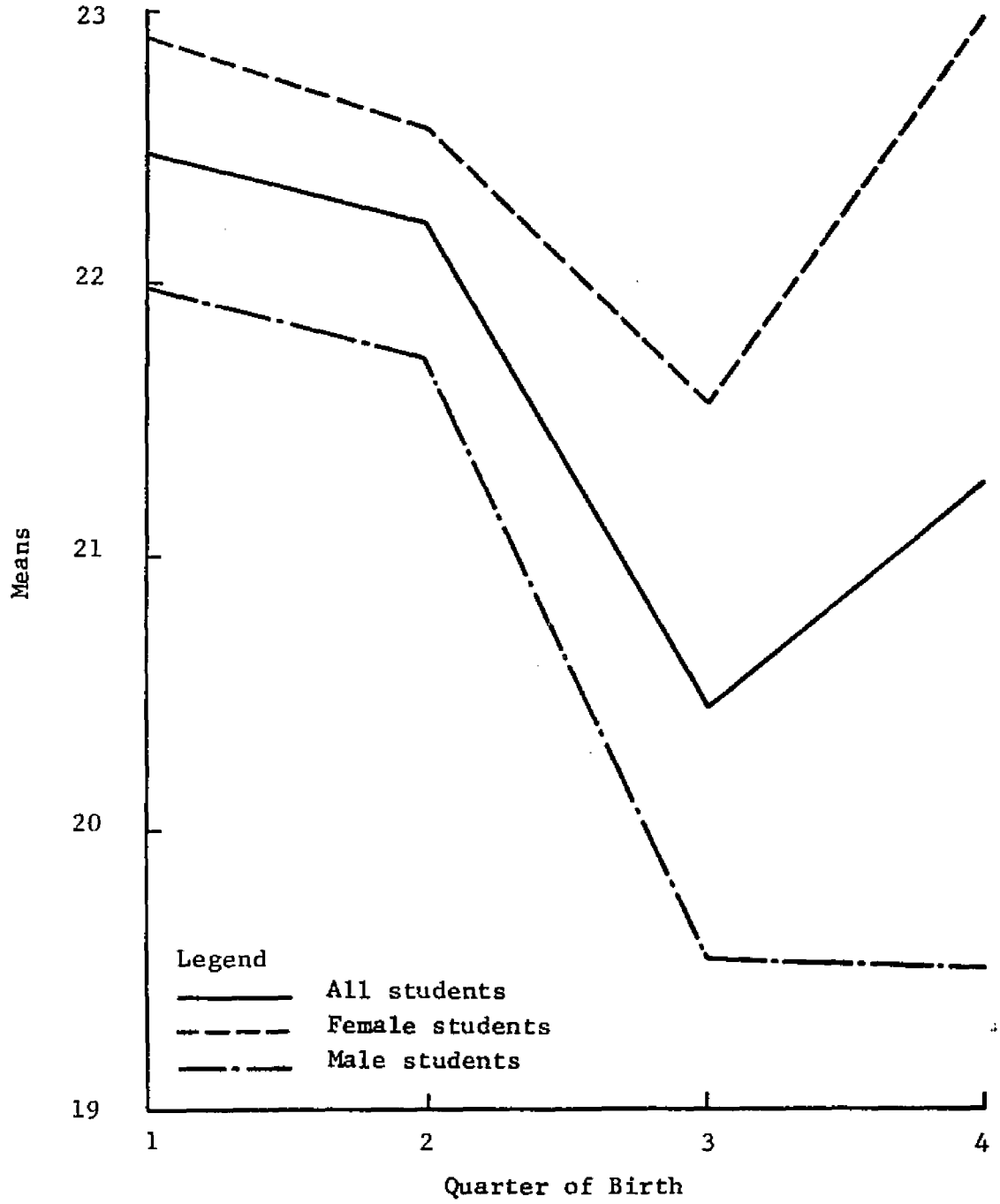

Figure 16

Mean Reading Comprehension Scores
by Quarters in Grade Three

1	16.901
2	17.539
3	16.263
4	16.409

These values were graphically presented in Figure 17.

The sex effect produced an F-value of 10.857 which was significant at the .01 level of confidence. Mean vocabulary scores by sex were:

Male	15.798
Female	17.655

Table 11 presents a distribution of these means by quarter of birth and sex.

An F-value of 0.515 was obtained as a result of the analysis of the interaction between quarter of birth and sex. This value failed to reject the null hypothesis. Figure 17 presents the mean reading vocabulary scores by quarter of birth for each sex.

Achievement in Reading

The statistical procedure produced an F-value of 1.583 which failed to reject the null hypothesis. The distribution of reading means by quarter of birth were:

1	39.374
2	39.761
3	36.701
4	37.773

Figure 18 presents these values graphically.

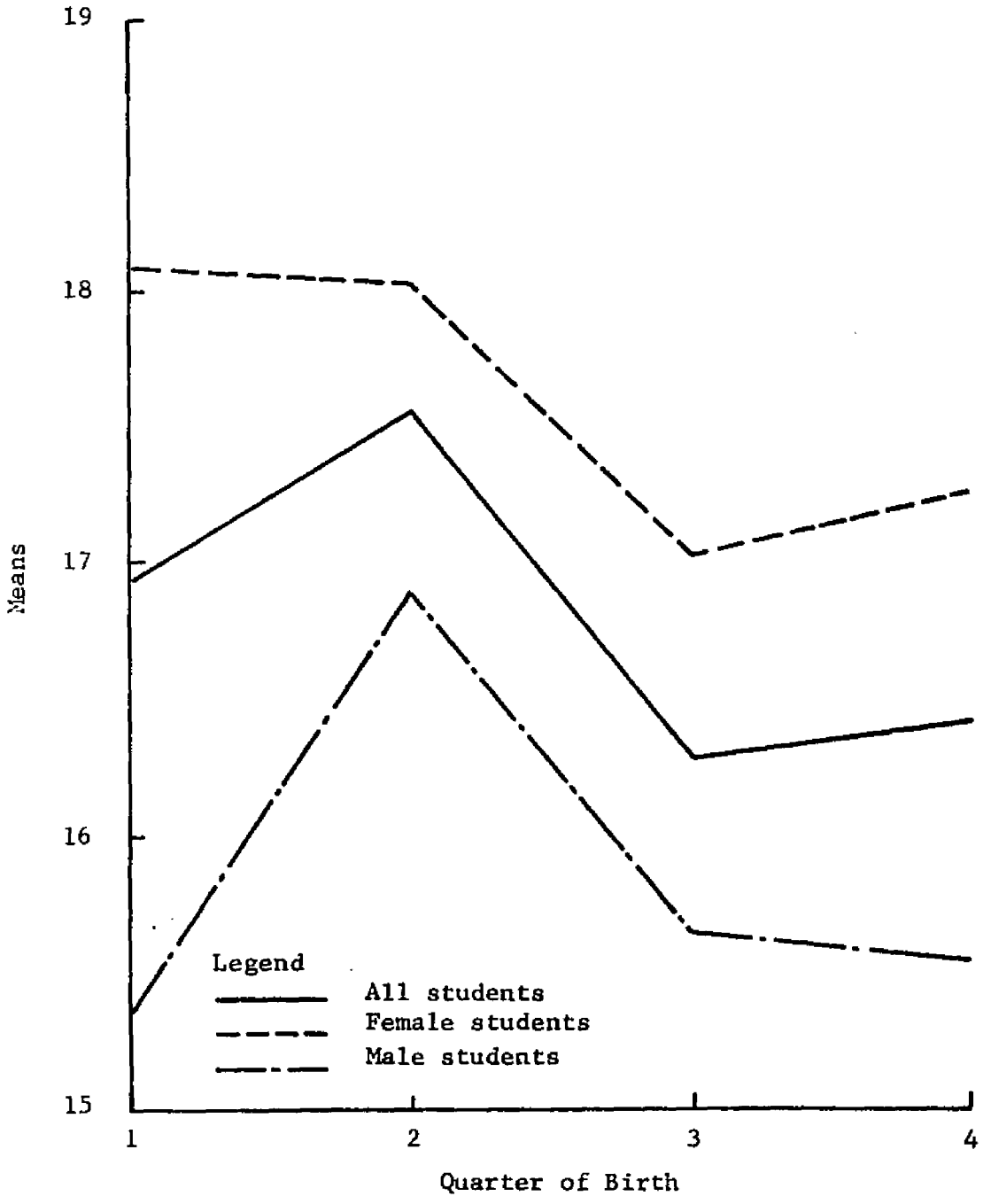

Figure 17

Mean Reading Vocabulary Scores
by Quarters in Grade Three

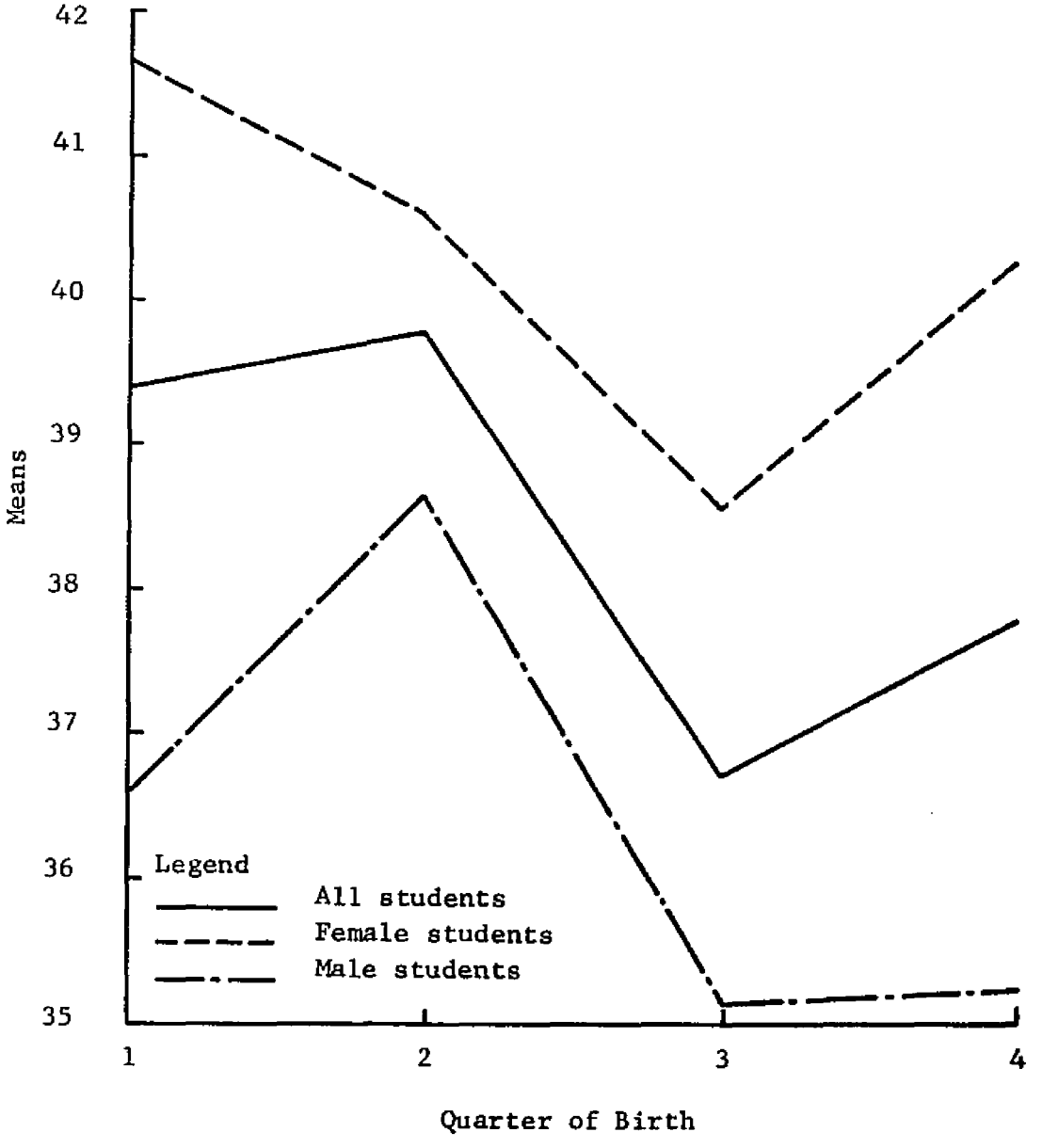

Figure 18

Mean Reading Achievement Scores
by Quarters in Grade Three

Mean reading achievement scores by sex for grade three were:

Male	36.245
Female	40.322

Sex, as a factor in reading achievement, was significant at the .01 level of confidence as indicated by an F-value of 14.403. This value justified the rejection of the null hypothesis. Table 11 presents a distribution of the reading means by quarter of birth for each sex.

The interaction effect was not significant. The F-value of 0.525 failed to reject the null hypothesis thus indicating that the differences in achievement between the sexes was consistent from quarter to quarter.

ACHIEVEMENT OF STUDENTS IN GRADE FOUR

Achievement in Arithmetic

Table 12 revealed an F-value of 1.083 for the quarter effect. This value was of insufficient magnitude to justify the rejection of the null hypothesis. Mean arithmetic scores by quarter of birth were:

1	22.832
2	23.188
3	21.533
4	21.100

These results were graphically depicted in Figure 19.

An F-value of 10.364 for the effect of sex upon the achievement of arithmetic was significant at the .01 level of confidence. This value led to a rejection of the null hypothesis. Mean arithemtic scores by sex for grade four were:

Table 12

Analysis of Variance at Grade Four for Dependent Variables Arithmetic, Comprehension, Vocabulary and Reading

Dependent Variable	Source of Variation	Degrees of Freedom	Partial Sum of Squares	F-Value
Arithmetic	Quarter	3	269.111	1.083
	Sex	1	858.444	10.364**
	Q*S	3	28.548	0.115
Comprehension	Quarter	3	140.821	0.959
	Sex	1	1017.043	20.786**
	Q*S	3	42.317	0.836
Vocabulary	Quarter	3	242.833	0.195
	Sex	1	723.576	13.993**
	Q*S	3	69.504	0.448
Reading	Quarter	3	1205.427	2.106
	Sex	1	2788.049	14.613**
	Q*S	3	181.720	0.317

**Significant at the .01 level of confidence

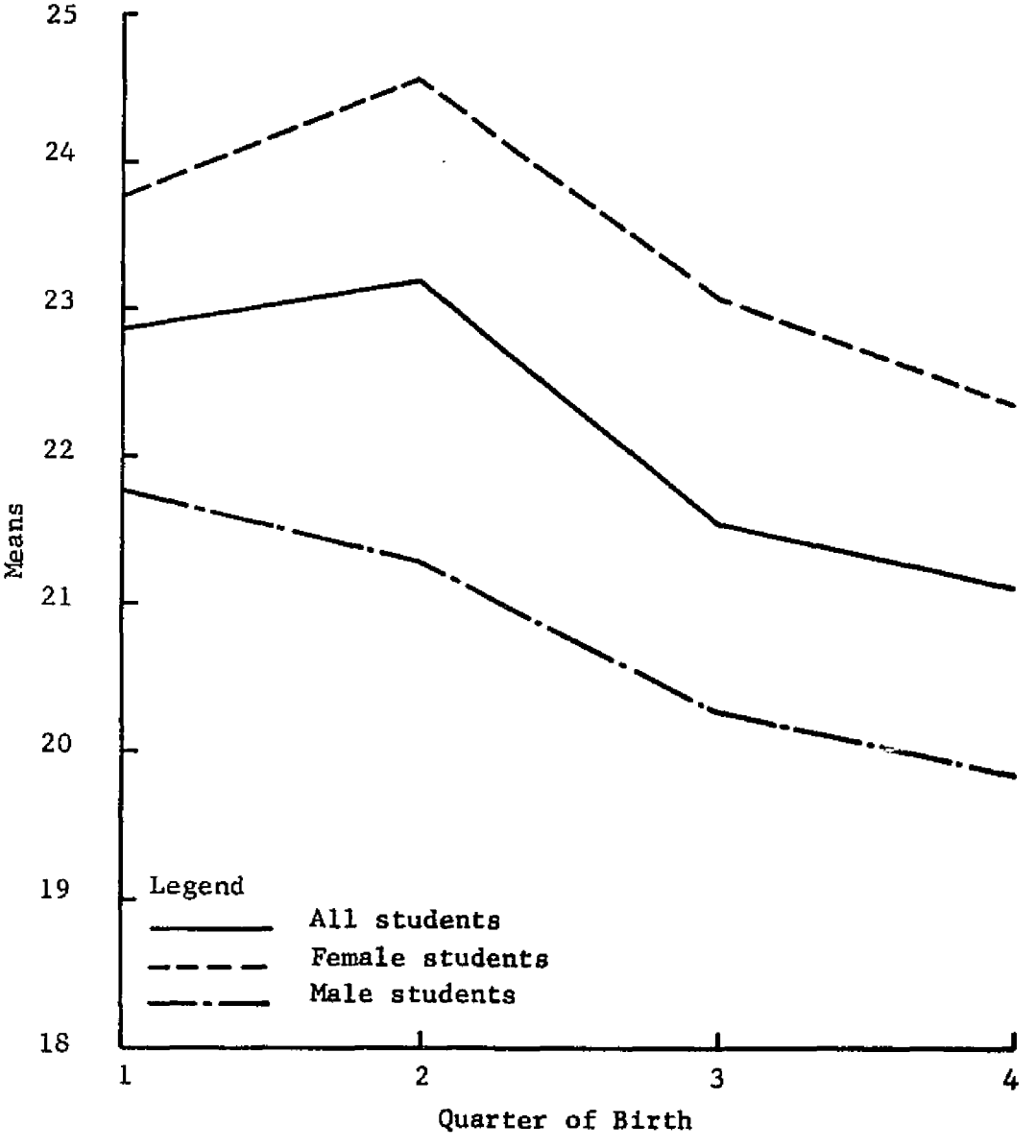

Figure 19

Mean Arithmetic Achievement Scores
by Quarters in Grade Four

Male	20.734
Female	23.492

A distribution of these means by quarter of birth for each sex is found in Table 13.

An F-value of 0.115 for the interaction effect of quarter and sex did not meet the test of significance. A study of Figure 19 indicated that the graphs by sex are almost parallel indicating that the overall differences by sex are consistent from quarter to quarter.

Achievement in Reading Comprehension

The analysis of variance using quarter as the source of variation resulted in an F-value of 0.959 which was not of sufficient magnitude to warrant the rejection of the null hypothesis. Means by quarter of birth for reading comprehension were:

1	25.046
2	25.342
3	23.810
4	24.010

These data are presented graphically in Figure 20.

A study of Table 12 revealed an F-value of 20.786 where sex was used as the source of variation. This value, significant at the .01 level of confidence, led to the rejection of the null hypothesis. The following indicates the mean reading comprehension scores by sex for grade four:

Male	23.004
Female	25.957

Table 13 indicates the distribution of the means by quarter of birth for each sex.

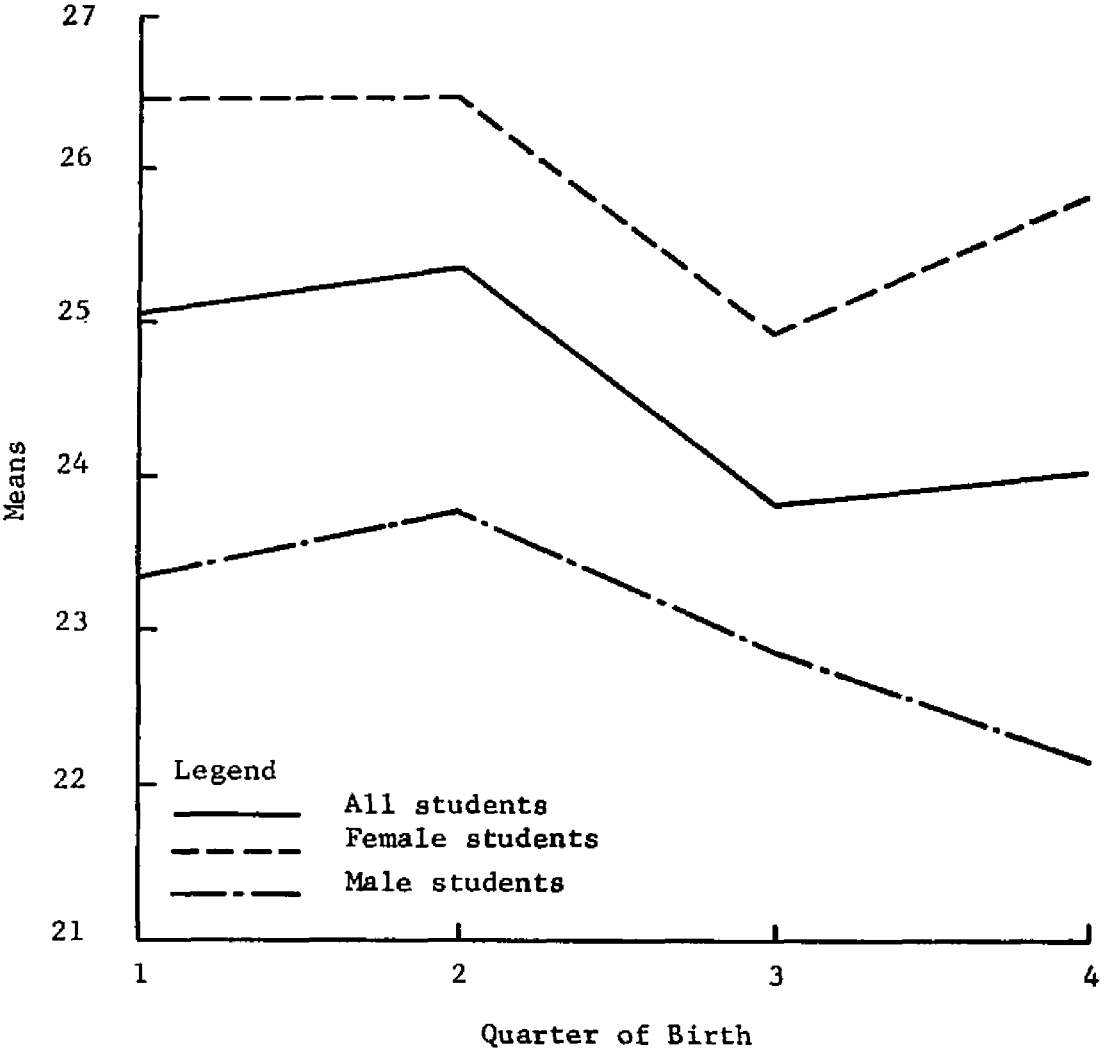

Figure 20

Mean Reading Comprehension Scores
by Quarters in Grade Four

Table 13

Mean Arithmetic and Reading Scores in Grade Four Classified According to Quarter of Birth and Sex

Quarter of Birth	Sex	Arithmetic	Reading		
			Comprehension	Vocabulary	Total
1	M	21.746	23.322	19.831	43.322
	F	23.722	26.458	22.222	48.681
2	M	21.265	23.755	19.429	45.429
	F	24.573	26.485	22.662	49.294
3	M	20.253	22.880	18.733	41.520
	F	23.081	24.935	20.000	44.035
4	M	19.815	22.148	19.037	41.185
	F	22.339	25.804	21.911	47.714

A study of Table 13 indicated that the difference in achievement between quarters is approximately the same for each sex. This is substantiated by an F-value of 0.288 for the interaction effect. An inspection of Figure 21 indicated that the graphs for each sex are almost parallel, thus no interaction existed.

Achievement in Reading Vocabulary

An F-value of 1.565 was obtained for the quarter effect when the analysis was performed on reading vocabulary. This value was not sufficiently large to warrant the rejection of the null hypothesis. Mean reading vocabulary scores by quarter of birth for grade four were:

1	21.145
2	21.308
3	19.307
4	20.500

These data are depicted in Figure 21.

The analysis of variance using sex as the source of variation yielded an F-value of 13.993 which was significant at the .01 level of confidence. Mean vocabulary scores by sex were:

Male	19.219
Female	21.736

A distribution of the mean scores by quarter of birth for each sex is found in Table 13.

An F-value of 0.448 was indicated in Table 12 for the interaction of quarter of birth and sex. This value failed to reject the null hypothesis.

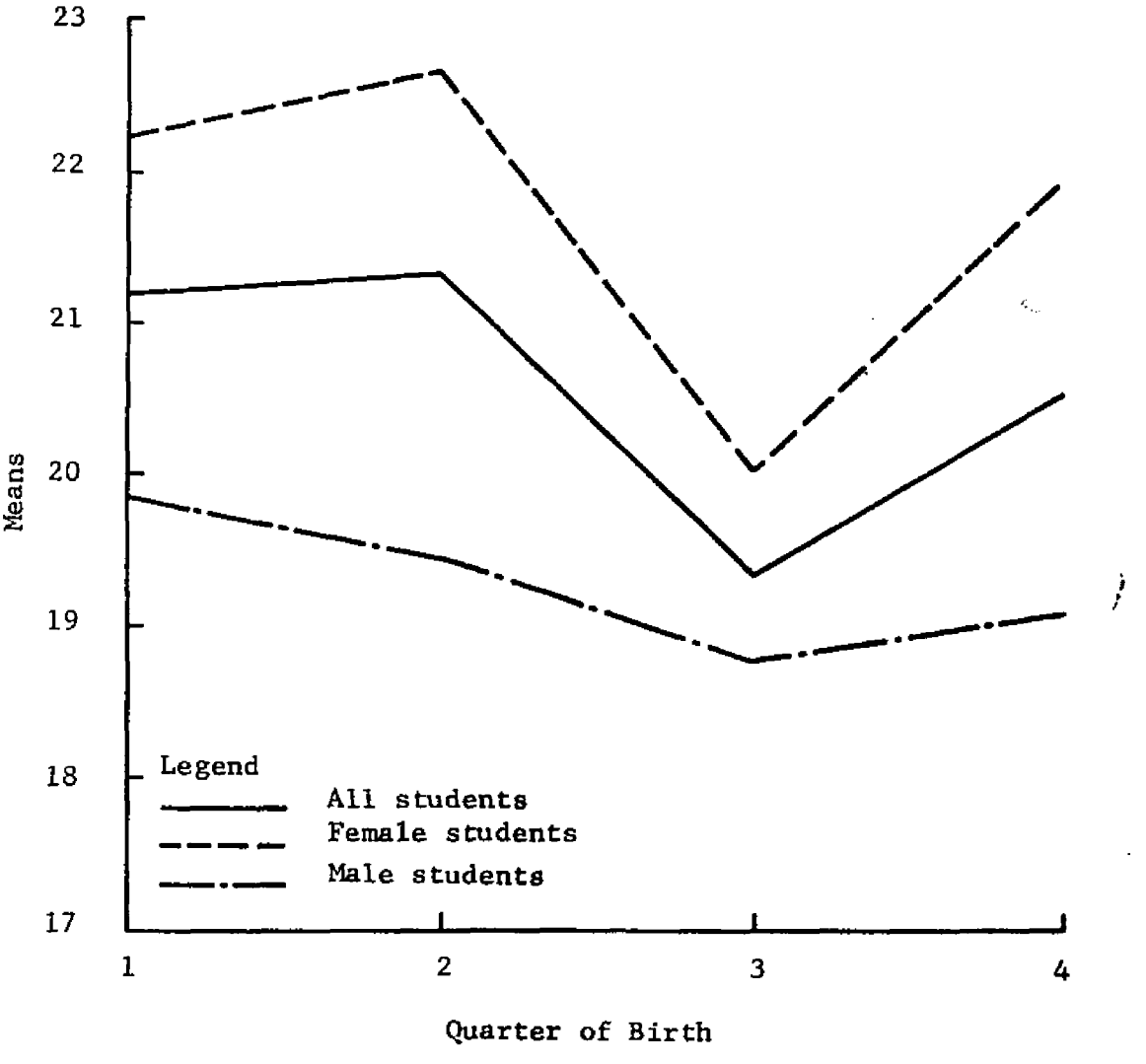

Figure 21

Mean Reading Vocabulary Scores
by Quarters in Grade Four

Achievement in Reading

The quarter effect for reading proved not to be significant when the analysis produced an F-value of 2.106. The reading means by quarter of birth were:

1	46.267
2	47.675
3	43.066
4	44.509

Figure 22 presents these values graphically.

The sex effect continued to be significant in grade four as it was in grade three. The analysis yielded an F-value of 14.613. This led to the rejection of the null hypothesis. Mean reading scores by sex for grade four were:

Male	42.700
Female	47.733

The mean distribution by quarter of birth for each sex is displayed in Table 13.

As in each dependent variable, the interaction effect was not significant, for the analysis of variance produced an F-value of 0.317. The difference in achievement between the sexes was consistent from quarter to quarter.

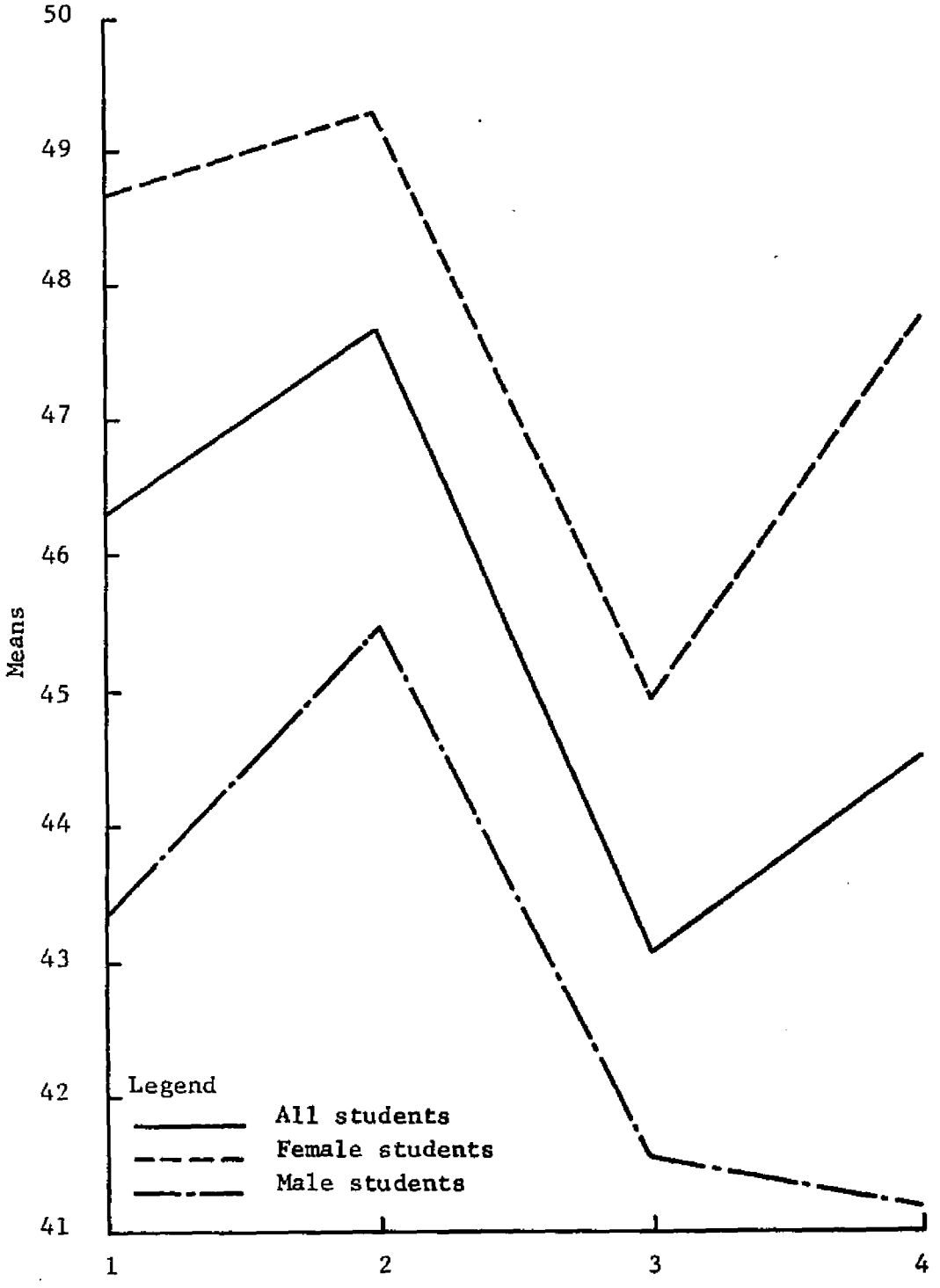

Figure 22

Mean Reading Achievement Scores
by Quarters in Grade Four

Chapter 4

FINDINGS AND CONCLUSIONS

The problem under study was: Is there a significant difference in the achievement of students when compared on the basis of age of entry into the first grade? The sample consisted of 495 students who entered the first grade in the Livingston Parish Schools, Livingston Parish, Louisiana, during the 1967-68 school year and who were administered the SRA Achievement Series for the four consecutive years under study.

Scores of the students in selected areas of achievement were categorized according to: (1) the quarter of the year when birth occurred and (2) sex. A factorial analysis of variance was then performed upon the raw scores. The regression sum of squares was partitioned into three sources of variation which produced a partial sum of squares for each source. An F-value for each source of variation was computed and tested for significance at the .05 and .01 levels of confidence.

When significant F-values were found for the variation, quarter of birth, linear orthogonal comparisons were employed to determine linear regression trends. Significance was determined by the computation of F-values which were tested for significance at the .05 and .01 levels of confidence. Graphs were utilized to depict the achievement by quarter of birth for all students and to depict achievement for each sex by quarter of birth.

Findings Using Quarter of Birth as the Source of Variation

Significant differences in the achievement of students were found to exist during the first two years under study. The only deviation from this pattern occurred in grade one for the variables arithmetic computation, reading comprehension and reading vocabulary. When no significance was found, an examination of the achievement means of all variables revealed a decrease in mean achievement from quarter one to quarter four. When these differences proved significant, a linear orthogonal comparison revealed that the decrease in mean schievement approximated a straight line regression.

In years three and four of this study the quarter effect ceased to be significant for all achievement variables.

Findings as Related to Sex

Sex, as a factor in the achievement of students, was not significant in the acquisition of arithmetic skills in grade one, two and three. The only deviation from this pattern occurred in grade one in the achievement in arithmetic computation where the female mean score was significantly higher than that of the male students. The sex effect, as related to achievement in arithmetic, was significant in grade four. Mean female achievement in arithmetic was significantly higher than the male mean achievement score. The sex effect was significant for achievement in reading for both grades one and two. Each reading variable, with the exception of reading vocabulary in grade one, proved to be significant at the .01 level of confidence. Female students scored significantly higher in the acquisition of reading skills.

Sex as a factor in the achievement of reading skills continued to be present in grades three and four. The female mean achievement score in reading comprehension, reading vocabulary and reading was significantly higher than the mean achievement score of male students.

Findings as Related to the Interaction of Quarter of Birth and Sex

The interaction effect was not significant in any area under consideration. This was interpreted to mean that the over-quarter achievement between the sexes was consistent from quarter to quarter.

Conclusions

Maturity, as it affects achievment, is a real factor. The data obtained in this study present strong evidence of its influence. In grades one and two, maturity was a significant factor in the achievement of students. Even in grades three and four, where the quarter effect ceased to be significant, an examination of the over-quarter mean achievement scores for all dependent variables indicated that the mean achievement scores for the first two quarters of the year were higher than those found in the third and fourth quarters. The quarter of the year in which a student was born did have an influence upon achievement.

Sex, as a factor in achievement, showed to be increasing in influence as the years of the study progressed. From only three areas of significance in grade one, the sex effect grew in magnitude through grade four where its effect was significant in all areas of achievement under study. The female student scored significantly higher than did the male student. One can only speculate as to the underlying causes.

The data provided by this study re-affirm the philosophy of individual differences. The results indicate the necessity for educational programs that will allow for such differences and which will ensure the opportunity for individual fulfillment in the academic endeavors of each student.

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VITA

Dennis Wayne Fleniken was born in Many, Louisiana, on November 27, 1941. After graduating from Mansfield High School he entered Louisiana Tech University from which he received both the Bachelor of Science degree and Master of Science degree.

He was employed by the Bossier Parish School Board from 1963-1970 where he served as a classroom teacher and as a Media Specialist. In 1970 he was appointed Science Supervisor at the Louisiana State University Laboratory School.

He is married to the former Patsy Laurice Larance. They are the parents of two children, Gregory Larance and Ashley Laurice.

EXAMINATION AND THESIS REPORT

Candidate: Dennis W. Fleniken

Major Field: Education

Title of Thesis: A LONGITUDINAL STUDY OF ACADEMIC ACHIEVEMENT IN TERMS OF AGE OF ENTRY INTO FIRST GRADE

Approved:

Sam Adams
Major Professor and Chairman

James G. Traynham
Dean of the Graduate School

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Date of Examination:

October 22, 1974